

# EXHIBIT C

## **Redacted Rebuttal Expert Report of Hal J. Singer**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEVADA**

IN RE:	)	Case No.: 2:15-cv-01045-RFB-(PAL)
	)	
Cung Le, Nathan Quarry, Jon Fitch, Brandon Vera,	)	CLASS ACTION
Luis Javier Vazquez, and Kyle Kingsbury,	)	
on behalf of themselves and all others similarly	)	
situated,	)	
	)	
Plaintiffs,	)	
	)	
vs.	)	
	)	
Zuffa, LLC, d/b/a Ultimate Fighting Championship	)	<b>REBUTTAL EXPERT REPORT OF</b>
and UFC,	)	
	)	<b>HAL J. SINGER, PH.D.</b>
Defendant.	)	

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## INTRODUCTION

1. I have been asked by counsel for Plaintiffs to respond to the reports of Professors Topel<sup>1</sup> and Oyer.<sup>2</sup> I have also been asked to respond to certain portions of the report of Professor Roger Blair,<sup>3</sup> and to certain portions of the report of Elizabeth Kroger Davis, Zuffa's accounting expert.<sup>4</sup>

2. The opinions expressed in this rebuttal report reflect my review of evidence, data, testimony, and other relevant materials to date. I reserve the right to supplement or amend my opinions should new materials or information become available.

3. Zuffa's expert witnesses fail to undermine the conclusions of my initial report, and in several instances either concede key underpinnings of my analyses or do not attempt to rebut them at all. Zuffa's economists focus, in particular, on the impact regressions presented in my initial report. To review briefly, my impact regressions are designed to test the hypothesis that, as Zuffa locked up a larger and larger share of Fighters in long-term restrictive contracts, it was increasingly able to underpay its Fighters, relative to what they would have been paid in a more competitive environment. I tested this theory by examining the relationship over time between: (a) the share of Fighters who Zuffa has locked up in long-term restrictive contracts ("foreclosure share"); and (b) the share of revenue Zuffa earns from putting on bouts ("Event Revenue") that

1. Expert Report of Professor Robert Topel (October 27, 2017) [hereafter "Topel Report"]. The capitalized terms used in this rebuttal such as Challenged Conduct and Fighters are the same terms as those defined in my initial report.
2. Expert Report of Professor Paul Oyer (October 27, 2017) [hereafter "Oyer Report"].
3. Expert Report of Professor Roger Blair (November 15, 2017) [hereafter "Blair Report"]. Counsel has asked me to respond, in particular, to ¶37, ¶¶42-48, ¶¶73-74, ¶79 of the Blair Report.
4. Expert Report of Elizabeth Kroger Davis (October 27, 2017) [hereafter "Davis Report"]. I have been asked to respond to Ms. Davis's claim in ¶20 that "as the financial statements of Bellator and Strikeforce reflect recurring losses, it is my opinion that both entities compensated athletes at unprofitable levels given their respective revenues and cost structures," as well as her claims in ¶¶111-114 as they relate to Zuffa's ability to pay Fighters the amounts implied by my damages estimates.

Zuffa pays its Fighters (“wage share” or “labor share”). The regression uses two sources of variation: (1) variation in Zuffa’s own compensation practices over time (comparing historical time periods when Zuffa was less dominant to more recent time periods); and (2) variation between Zuffa’s compensation practices and those of Strikeforce before Zuffa acquired it (comparing Zuffa’s compensation practices to those of a non-dominant rival). If the Challenged Conduct were not anticompetitive, the model’s analysis of Zuffa’s Fighter compensation based on (1) and (2) would not have yielded results supportive of my hypothesis. But they did: After controlling for a host of factors that could also influence Fighter compensation, my impact regressions found that, as Zuffa increased its control over the MMA industry by locking up Fighters to long-term exclusive contracts, Zuffa paid its athletes a lower wage share (relative to both Strikeforce and Zuffa itself historically). Thus, my central econometric analysis shows that Zuffa suppressed the wage share of Fighters as its dominance of the market increased, just as economics would predict.

4. This wage-share impact regression model served as the primary basis of my proof of common impact: The regression model predicts that Zuffa paid virtually all Bout Class members less than these Fighters would have been paid in the but-for world. In other words, this model is a class-wide method of proving common impact. My impact regression also demonstrated that the Challenged Conduct had substantial anticompetitive effects, and was one of the ways I computed classwide damages to each of the proposed classes (the Bout Class and the Identity Class).

5. With no credible basis for overturning the results of my impact regression model, Zuffa’s economists have focused on my use of wage share as the dependent variable in my estimation method. According to Zuffa’s three economists, the only appropriate means of

assessing the impact of the Challenged Conduct on Fighter compensation is the wage *level* (the amount of money Zuffa paid Fighters *measured in dollars*)—as opposed to the wage *share* (the proportion of event revenue Zuffa paid Fighters *measured as a percentage*). However, as demonstrated in detail below, my use of wage share is supported by, among other things: (1) the economic literature, which uses wage share in the exact same context (including most prominently in professional sports) as I do here; (2) the UFC’s own practices in that it used wage share in its ordinary course of business and in the preparation of its sale to WME; and, (3) Drs. Topel and Blair themselves, who have both used wage share as economic consultants. My use of wage share here is also consistent with the empirically and factually supported point that, as in many other professional sports, the athletes, here the Fighters, are the major draw for MMA consumers, and thus the main driver of Zuffa’s Event Revenue. Every expert involved in this litigation, including Zuffa’s, recognizes that revenue generation is proportional to athlete productivity. Thus, all else equal, if Fighter compensation fails to keep pace with the growth in Zuffa’s Event Revenue, that is evidence of the exercise of monopsony power. That is precisely what my econometric analysis finds.

6. Despite all this, both Dr. Topel and Dr. Oyer claim that only the *level* of Fighter compensation, even as Event Revenue grew dramatically during the relevant period, is the appropriate focus of economic analysis in this case. In doing so, they implicitly assume (nonsensically) that Zuffa’s Event Revenue bears no relationship to the productivity—indeed the revenue-generating power—of its own Fighters. This underpinning of their analyses contradicts,

among other things, elementary economic theory, standard practice in sports economics,<sup>5</sup> extensive record evidence in this case, and their own testimony.

7. Dr. Topel does make one lone attempt to incorporate Event Revenue into his analysis.<sup>6</sup> But, as explained below, that approach assumes away the effect of the Challenged Conduct: His analysis implicitly incorporates the assumption that the Challenged Conduct had *no effect* on the proportion of Event Revenue that Zuffa paid to its Fighters. In other words, he assumes away the very hypothesis that my impact regressions are designed to test. His attempt to incorporate Event Revenue also suffers from fatal and well-understood econometric flaws (including simultaneity bias), which are discussed below as well.

8. In addition to the rich empirical history and record basis for my use of wage share, wage share is an appropriate and well-recognized means of assessing the impact of monopsony power on the compensation of professional athletes from a theoretical perspective. To understand

5. To take a few of many examples discussed further below: Professor Scully, a pioneer in the sports economics field, explained in an article published in 2004 that “[w]hile all professional team sports had monopsonistic labor markets in the past, all have veteran free agency now. This change from a restricted to a free labor market...creates a natural experiment in which the effects of freedom of the market can be examined and measured.” In performing his analysis, Professor Scully calculated compensation *as a share of revenue* for Major League Baseball, the National Basketball Association, the National Football League, and the National Hockey League; for each sport, he found that compensation increased substantially *as a share of revenue* after free agency was introduced. Gerald Scully, *Player Salary Share and the Distribution of Player Earnings*, 25(2) MANAGERIAL AND DECISION ECONOMICS, 77-86, 77-78 (2004). Similarly, Professor Vrooman, another sports economist, explains that “[a]s the result of internal competition among sportsman owners, monopsonistic exploitation has virtually vanished over the last decade in all [major professional sports] leagues. All leagues have similar carrying capacities for player costs at *two-thirds of revenues* and current payroll cap percentages are almost identical at about 60 percent.” John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) REVIEW OF INDUSTRIAL ORGANIZATION 5-44, 42 (2009) (emphasis added). Professor Monks, another sports economist, explains in one of his academic papers the prominence of wage share in evaluating the degree of monopsony power being exercised by sports teams: “A common method of estimating the degree of monopsony control of an industry or employer is to compare the marginal revenue product of an athlete to his or her compensation. This exercise is fraught with difficulties and complexities under the best of circumstances, and clearly is untenable when considering millions of athletes across numerous sports. An alternative mechanism for establishing the degree of monopsony control in a sporting industry is to examine the *share of revenue* returned to the players. *Economists have often used the share of revenue returned to the players in the form of salaries as evidence of the degree of monopsony control.*” (emphasis added). James Monks, *Revenue Shares and Monopolistic Behavior in Intercollegiate Athletics*, Cornell Higher Education Research Institute Working Paper 155 (September 2013), at 3 [hereafter “Monks (2013)’].

6. As explained below, Dr. Topel includes Event Revenue as a control variable in some of his regressions.

why, one needs to understand the basic building blocks of labor economics. Economists define the marginal revenue product (“MRP”) of labor as the increase to a firm’s revenues caused by the increase to the firm’s output produced by the last worker employed, holding all else constant. In competitive labor markets, economic theory shows that workers will be hired up to the point when a worker’s MRP is equal to the wage rate. In monopsony labor markets, by contrast, wages will be set *below* the MRP. That is so because the monopsonist faces an upward-sloping labor supply curve, meaning that the firm can push wages down (and generate savings across all employees) by restricting the number of workers it hires.<sup>7</sup> If one could observe a Fighter’s MRP directly, then estimating the deviation of that Fighter’s wage from his MRP would inform the degree to which Zuffa exercises monopsony power over Fighters: The bigger the gap between a Fighter’s MRP and her wage, the more monopsony power the firm is exercising. However, as economists recognize, MRP is not directly observable. Fortunately, the amount of revenue generated at a Live MMA Event is a reasonable proxy for the MRP of the Fighters competing in that event. Thus, the next best type of evidence of Zuffa’s monopsony power is to examine a Fighter’s compensation as a share of Event Revenue (the wage share). And that is precisely what I did here.

9. In short, as discussed in detail below, on the central disagreement between the economists in this case—whether to estimate a regression using wage *shares* or wage *levels* as the dependent variable—Zuffa’s economists have made a fatal mistake. Their approach is inconsistent with actual business practices in the MMA industry, with the relevant applied

7. There is a direct parallel between a monopolist—a *seller* with market power—and a monopsonist—a *buyer* with market power. Just as the monopolist’s optimal markup over marginal cost varies inversely with the elasticity of consumer *demand*, the monopsonist’s optimal markdown below MRP is inversely related to the elasticity of labor *supply*. The solution to the monopolist’s problem of what price to charge is given by  $(p-c)/p = -1/E_D$ , where  $p$  is the price,  $c$  is the marginal cost, and  $E_D$  is the elasticity of consumer demand. By symmetry, the solution to the monopsonist’s problem of what wage to pay is  $(MRP-w)/w = -1/E_S$ , where  $w$  is the wage, MRP is the worker’s marginal revenue product, and  $E_S$  is the elasticity of labor supply.

economics literature, with economic theory, and with proper statistical analysis. For these reasons, I was correct to use wage shares as the dependent variable in my regressions.

10. Further, as detailed below, Zuffa's economists fail to undermine any aspect of my findings and conclusions, including: (1) that Zuffa has significant market power; (2) that the Challenged Conduct substantially foreclosed competition; (3) that the Challenged Conduct permitted Zuffa to exercise its market power to substantially harm competition; (4) that the harm flowing from the Challenged Conduct was widespread across members of both proposed Classes and thus can be said to have caused common impact across each Class; (5) that aggregate are \$1.6 billion for the Bout Class and \$37.2 million for the Identity Class; and (6) that the efficiency defenses of the Challenged Conduct proffered by Zuffa and its economists are unavailing.

#### **QUALIFICATIONS**

11. My qualifications are contained in my initial report. In the interim, I have testified in a few new matters, which are summarized in my CV, attached in the Appendix.

#### **I. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY CONCLUSION THAT ZUFFA HAS SIGNIFICANT MARKET POWER AND THAT THE CHALLENGED CONDUCT SUBSTANTIALLY FORECLOSED COMPETITION**

12. My initial report used standard indirect and direct methods of proof to demonstrate that Zuffa wielded significant monopoly and monopsony power at least since the beginning of, and extending throughout, the Class Period. My analyses have all confirmed the evidence showing that Zuffa is widely recognized as the dominant promoter of professional Live MMA Events.<sup>8</sup> My initial report also demonstrated that access to a broad stable of MMA Fighters is a critical input necessary to stage successful Live MMA Events, and that the Challenged Conduct substantially

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8. Expert Report of Hal J. Singer, PhD (August 31, 2017) [hereafter "Singer Report"], Parts III.A-B.

foreclosed competition by ensuring that Zuffa's would-be rivals lacked access to this critical input.<sup>9</sup> In this section, I explain why Zuffa's economists fail to undermine these conclusions.

**A. Zuffa's Economic Economists Fail to Undermine, and in Many Ways Bolster, My Indirect Proof of Zuffa's Market Power**

13. As explained in my initial report, a relevant antitrust output product market is comprised of a product or group of products such that a hypothetical monopolist that was the only present and future *seller* of those products could profitably impose a small but significant and non-transitory increase in price (the “SSNIP”) over the competitive level.<sup>10</sup> When it comes to input markets, market definition proceeds analogously: A relevant (input) market consists of a product or group of products such that a hypothetical monopsonist that was the only present and future *buyer* of those products could profitably impose a small but significant and non-transitory decrease in prices (or wages) below the competitive level.<sup>11</sup> The combination of dominant market shares and barriers to entry allows me to conclude that Zuffa possessed monopoly power in the Relevant Output Market and monopsony power in the Relevant Input Market and Submarket since at least the beginning of the Class Period.<sup>12</sup>

14. In my initial report, I define a Relevant Input Market of MMA Fighters, measured in two ways using industry-accepted databases.<sup>13</sup> I also define a Relevant Input Submarket of Headliners, consisting of all Fighters ranked one through fifteen according to industry-accepted databases in any of the ten major MMA weight classes.<sup>14</sup> I also define the Relevant Output Market as Live MMA Events in which the participating Fighters are in either the Relevant Input Market or

9. *Id.* Part III.C.

10. *Id.* ¶97.

11. *Id.* ¶98.

12. *Id.* ¶96.

13. *Id.* Part III.A.1.

14. *Id.*

the Relevant Input Submarket.<sup>15</sup> My initial report demonstrates that Zuffa's Fighters account for dominant shares of the Relevant Input Market,<sup>16</sup> the Relevant Input Submarket,<sup>17</sup> and that Zuffa itself has a dominant share of the Relevant Output Market.<sup>18</sup> With respect to the Relevant Output Market, I define the relevant geographic market as encompassing Live MMA Events in the Relevant Output Market broadcast in North America.<sup>19</sup> With respect to the Relevant Input Market and Submarket, I also define the relevant geographic market as North America.<sup>20</sup> My initial report demonstrates that, at least since the beginning of, and extending throughout the Class Period, Zuffa possessed dominant shares in the Relevant Input Market and Submarket,<sup>21</sup> and in the Relevant Output Market.<sup>22</sup>

15. My initial report also demonstrates that rival MMA promoters face substantial barriers to entry and expansion in the Relevant Output Market, due in part to the Challenged Conduct, including Zuffa's staggered, long-term exclusive contracts with Fighters.<sup>23</sup> The combination of dominant market shares and barriers to entry allows me to conclude that Zuffa possessed monopoly power in the Relevant Output Market and monopsony power in the Relevant Input Market and Submarket since at least the beginning of the Class Period. As explained below, Zuffa's economists fail to undermine these conclusions.

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15. *Id.* Part III.A.2.

16. *Id.* Part III.A.4.

17. *Id.*

18. *Id.* Part III.A.5.

19. *Id.*

20. I conservatively include ONE Championship in the Ranked measure of the Relevant Input Market even though it is outside of the Relevant Geographic Market. *Id.* Part III.A.5.

21. *Id.* Part III.A.4.

22. *Id.* Part III.A.5.

23. *Id.* Parts III.A.6-7.

## 1. Relevant Input Market and Submarket

16. My initial report conservatively defines the Relevant Input Market and Submarket to include Fighters from many non-Zuffa MMA promoters.<sup>24</sup> I took this approach despite evidence showing that even the most prominent non-Zuffa MMA promoters are at best distant substitutes to Zuffa from the perspective of Fighters.<sup>25</sup> As a result, my analysis is conservative in the sense that it uses market definitions that tend to underestimate Zuffa's market power. The "Tracked" measure of the Relevant Input Market (which encompasses MMA promoters tracked by a third-party data collection source used by promoters and others in the MMA industry known as FightMetric) includes Fighters associated with eight MMA promoters in addition to the UFC.<sup>26</sup> The "Ranked" measure of the Relevant Input Market (which includes Fighters ranked in the top 650 in any of the fourteen MMA weight classes in the FightMatrix database, a different third-party database from FightMetric) includes Fighters associated with hundreds of MMA promoters.<sup>27</sup> The Headliner Relevant Input Submarket (consisting of all Fighters ranked one through fifteen in any of the ten major MMA weight classes) also includes Fighters associated with hundreds of MMA promoters.<sup>28</sup>

24. *Id.* Part III.A.1.

25. *Id.* Parts III.A.1, III.A.8. My initial report follows the DOJ/FTC *Merger Guidelines* in defining the Relevant Input Market and Submarket based on the alternatives to which Fighters could reasonably substitute to counteract an exercise of monopsony power by Zuffa. *Id.* ¶¶97-99.

26. *Id.* ¶109, Table 2.

27. *Id.* ¶111.

28. *Id.* ¶114. Dr. Topel claims that I dismiss Bellator, ONE Championship ("ONE"), and the Professional Fighters League as "competitively insignificant." Topel Report ¶77. This claim is false. Although it is unlikely that ONE or Professional Fighters League has any real competitive significance for Zuffa and that Bellator likely has only slight significance, to be conservative, I nonetheless include Fighters from each of these promotions in one or more of my measures of the Relevant Input Market and Submarket: Fighters from Bellator, Professional Fighters League (rebranded from WSOF), and ONE are encompassed in the Ranked measure; Fighters from Bellator and Professional Fighters League/WSOF are included in the Headliner Submarket; Fighters from Bellator are also included in the Tracked measure.

17. Dr. Topel claims that the Tracked measure of the Relevant Input Market is flawed merely because it “exclude[s] many other MMA promoters and their fighters.”<sup>29</sup> But any market definition exercise would, by construction, include some Fighters while excluding others.<sup>30</sup> The relevant question is whether a hypothetical monopsonist that was the only present and future buyer of the services of Fighters included in the Relevant Input Market could profitably impose a small but significant and non-transitory decrease in compensation below the competitive level.<sup>31</sup> Dr. Topel offers no convincing evidence that a decrease in compensation by a hypothetical monopsonist over the Tracked measure of the Relevant Input Market would be unprofitable. He simply notes that the Tracked measure excludes some Fighters whose rank exceeds that of the *worst-ranked Zuffa Fighters*.<sup>32</sup> That is hardly evidence that a hypothetical monopsonist over Tracked Fighters would lack monopsony power—that is, would require control of the omitted Fighters from the Relevant Input Market to reduce wages below competitive levels. One would not expect Zuffa to need to control its worst-ranked Fighters to exercise monopsony power, and so Dr. Topel is wrong that excluding some Fighters comparable to Zuffa’s worst-ranked Fighters makes a market definition inappropriate. Nor does Dr. Topel provide evidence that any Fighters excluded from the Relevant Input Market are reasonably substitutable with Zuffa Fighters. Similarly, Dr. Topel claims that the Tracked definition is flawed because it “does not include all major MMA promoters, only those that third parties are willing to pay for.”<sup>33</sup> But during his deposition, Dr. Topel admitted that FightMetric, as a business with a profit motive to collect all relevant saleable

29. Topel Report ¶31.

30. Department of Justice & Federal Trade Commission, Horizontal Merger Guidelines (August 9, 2010) §4.1.1 [hereafter, “Merger Guidelines”].

31. *Id.* §4.1.1; *id.* §12; *see also* Singer Report ¶98.

32. Topel Report ¶212; *id.* Exhibit 24.

33. *Id.* ¶¶208-210.

fight data, has incentives to include any fighter with non-covered promotions so long as a third-party was willing to pay for it.<sup>34</sup> This concession undermines Dr. Topel's opinion; the market's willingness to pay for some Fighter statistics and not others is itself an economic indicator of the relevance of the Tracked Fighters. That the market is unwilling to pay to track the careers of certain Fighters is an indication that the untracked Fighters are at the fringe of the profession (of limited interest to both fans and MMA promoters), and thus not important to an analysis of market power.<sup>35</sup>

18. Dr. Topel claims that the Headliner Relevant Input Submarket "conflates athletes' ability with promoter acumen."<sup>36</sup> This claim is both irrelevant to market definition and wrong. Even if his claim were true, it would not imply that a hypothetical monopsonist over Headliners could not exercise monopsony power. Supposing (counterfactually) that promoter acumen were the sole reason for Zuffa's dominance of the Relevant Input Submarket, Zuffa would still dominate the submarket and would, as a result, possess monopsony power.<sup>37</sup>

19. Setting this aside, Dr. Topel's evidence of Zuffa's "promoter acumen" is both inadequate and unpersuasive. It is inadequate because—even if Zuffa's high share of the Input Submarket were indicative of Zuffa's business acumen with respect to promoting fights and Fighters—it would not refute the record evidence and analysis in my initial report that Zuffa

34. Topel Dep. at 483:11-19.

35. Dr. Topel also conceded that there are vast differences in the value of professional MMA Fighters to an MMA promotion, including notoriety, rank, record, and other indicia of quality. Dr. Topel acknowledged that (a) on average consumers are willing to pay more to see matches between highly ranked Fighters, *id.* at 432:10-17, (b) on average higher ranked fighters generate more revenues when they fight than lower ranked fighters, *id.* at 432:18-24, (c) "not all fighters are exact substitutes for each other," *id.* at 450:8-11, (d) "some fighters are more important to an MMA promotion than others," *id.* at 450:12-16, (e) "some fighters generate more revenues when they fight" than others, *id.* at 450:17-19, and (f) fighters capable of generating more revenues when they fight, all things equal, are more valuable to their promotion than other fighters, *id.* at 450:20-451:5.

36. Topel Report Part C; *see id.* ¶¶213-217.

37. Indeed, Dr. Topel himself recognizes that "possessing monopoly or monopsony power in and of itself is not anticompetitive." *Id.* ¶38.

possesses monopsony power.<sup>38</sup> The point of defining a market is to determine whether Zuffa has market power. Dr. Topel's argument about "promoter acumen" does not refute that Zuffa has market power; it merely offers a potential explanation for how it acquired (or maintained) that market power. That Zuffa possesses substantial market power (whether obtained through skill, luck, the productivity of its Fighters, or other means) does not resolve whether its conduct is anticompetitive, nor does it address whether Zuffa's conduct has helped Zuffa maintain or enhance its market power. Those are separate issues. The Challenged Conduct is anticompetitive because, as shown in my initial report and below, it has allowed Zuffa to maintain, extend, and enhance its market power to substantially harm competition.<sup>39</sup>

20. Dr. Topel's evidence of Zuffa's "promoter acumen" is also unpersuasive on its own terms. It consists solely of Exhibit 25 of his report, purporting to demonstrate that "Zuffa has a strong history of helping athletes develop from a low rank into the Top 15."<sup>40</sup> What the exhibit actually demonstrates is that, over time, an increasing percentage of Fighters who became Headliners at Zuffa were not Headliners when they first fought for Zuffa. But this is simply a consequence of the fact that, as Zuffa's share of the Headliner market increased, fewer and fewer Headliners were associated with non-Zuffa promoters (as the Challenged Conduct resulted in negligible opportunities for Fighters' career advancement at other MMA Promoters). Put differently, Dr. Topel's Exhibit 25 simply confirms that Zuffa's share of the Headliner Submarket has increased over time. That is entirely consistent with my own analyses and conclusions, namely that Zuffa possessed a dominant share of the Headliner Submarket, and that absent the Challenged Conduct, Zuffa either would have lost these Fighters to other MMA promotions or would have

38. Singer Report ¶5; *id.* Part III.

39. Singer Report ¶5; *id.* Part III. *See also* Parts I.C and II, *infra*.

40. Topel Report ¶214, Exhibit 25.

been forced to pay them a competitive wage—that is, substantially more.<sup>41</sup> Finally, even according to Dr. Topel’s Exhibit 25, between 21 percent and 49 percent of what Dr. Topel terms “Zuffa Headliner Streaks” during the Class Period involved Fighters who achieved Headliner status *before* they came to Zuffa.<sup>42</sup>

21. Dr. Topel also claims that the Headliner Submarket “raises questions about the commonality of the proposed class,”<sup>43</sup> and that “any ‘impact’ of Headliner share tells us nothing about impacts on other athletes.”<sup>44</sup> That is incorrect. My impact regression, along with abundant other evidence, confirms that, by controlling Headliners, Zuffa was able to maintain monopoly power in the Relevant Output Market and monopsony power in the Relevant Input Market, and thereby suppress compensation to UFC Fighters generally.<sup>45</sup> Because being matched against other prominent Fighters is the primary career objective for an MMA Fighter (or at least the means of obtaining the primary career objective),<sup>46</sup> by controlling the top Fighters, UFC became the dominant destination for other Fighters.<sup>47</sup> Dr. Topel himself concedes that “[t]here is a *natural* tendency for a leading promoter to attract a significant share of the top athletes. This follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best....”<sup>48</sup> This tendency toward monopoly explains why the

41. Singer Report ¶5; *id.* Parts III.C-D..

42. Topel Report Exhibit 25, fourth column (displaying “% of Zuffa Headliner Streaks With Non- Headliner Rank at Time of First Ever Zuffa Bout”). This statistic ranges from 51 percent to 79 percent between 2011 and 2017. Therefore, between (1- 79) = 21 percent and (1- 51) = 49 percent of Zuffa Headliner Streaks involved Fighters who achieved Headliner status before coming to Zuffa.

43. *Id.* ¶218.

44. *Id.*

45. Singer Report ¶105, ¶¶112-114; *see also id.* Table 6, column (3) (showing that in increase in Zuffa’s foreclosure of Headliners suppresses Fighter Shares for UFC Fighters generally); *see also id.* ¶¶156-165.

46. *Id.* ¶20 (“Fighting at the Top of the Card is the primary career objective for an MMA Fighter. Thus, the most successful Fighters accumulate enough wins with the goal of being matched against other prominent Fighters, and eventually a chance at winning a championship belt and obtaining a top ranking.”).

47. *Id.* ¶105, ¶¶112-114, ¶¶156-165.

48. Topel Report ¶96 (emphasis added).

Challenged Conduct was particularly effective as a means to maintain market power: If the dominant MMA promoter could sign the vast majority of top Fighters to long-term exclusive deals, and (if necessary) acquire potential rival MMA promotions whenever a promoter seems to have amassed a core group of top Fighters, then that dominant promoter would be able to perpetuate its control over the Relevant Input and Output Markets. That tipping of the market is precisely what Zuffa has done here. And Dr. Topel himself has conceded that by having the vast majority of top Fighters under multi-fight exclusive contracts, Zuffa created an artificial barrier to entry for potential MMA promotion rivals.<sup>49</sup> The incentives pushing Fighters to sign with an MMA promoter who already has the other top Fighters also explains why a dominant share in the Headliner Submarket conferred monopsony power to Zuffa—controlling only the top Fighters would itself be sufficient to control the entire market, and thereby enable Zuffa to suppress compensation to all (or nearly all) of its Fighters.<sup>50</sup>

22. My initial report explains that the Headliner Submarket includes the ten major MMA weight classes,<sup>51</sup> and that this metric is conservative, because Zuffa has had a disproportionate share of Headliners within the most prominent weight classes that generate the most PPV revenue.<sup>52</sup> Dr. Topel claims that the Headliner Submarket “artificially inflates Zuffa’s share of MMA athletes”<sup>53</sup> because it excludes four minor weight classes (men’s strawweight,

49. Topel Dep. at 437:11-22 (“So . . . having the vast majority of top fighters, whatever vast means there, under – under your contracts, whether they be multi-fight contracts or what, if people want to be there together, that creates . . . an advantage, a competitive advantage that, all other things the same, make – an entrant’s going to have to overcome that in order to come in and compete head-to-head and have the same success as Zuffa.”) (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM).

50. Classwide evidence of a compensation structure among Zuffa Fighters further confirms that suppression of compensation to some Fighters (such as Headliners), implies suppression to all or almost all Bout Class members. *See, e.g.*, Singer Report Part IV.B.

51. *Id.* ¶17, ¶99, n.268.

52. *Id.* ¶129, n. 351.

53. Topel Report ¶215.

women's featherweight, women's flyweight, and women's atomweight) in which "Zuffa has not traditionally participated."<sup>54</sup> Dr. Topel provides no evidence that a hypothetical monopsonist over most or all of the ten major MMA weight classes could not exercise monopsony power over Fighters unless the Relevant Input Submarket were extended to include these four minor weight classes. Dr. Topel also ignores that these four minor weight classes are not tracked by fan websites such as *USA Today/MMA Junkie*,<sup>55</sup> TBS's *Bleacher Report*,<sup>56</sup> and ESPN's *MMA Power Rankings*<sup>57</sup>—an indication of the omitted weight classes' relative lack of importance in the industry. Finally, my Ranked measure of the Relevant Input Market conservatively includes even these four minor weight classes.<sup>58</sup>

23. Dr. Topel claims that the Headliner Submarket definition "implies that top athletes are interchangeable across weight classes."<sup>59</sup> That is incorrect: What matters for market definition is not whether all Fighters are perfectly fungible with all other Fighters, but whether a hypothetical monopsonist over a group of Fighters could depress their compensation below competitive levels.<sup>60</sup> It is no doubt true that Fighters from different weight classes are often not perfectly interchangeable (although Fighters do sometimes transition between neighboring weight classes).<sup>61</sup>

54. *Id.*

55. See <http://mmajunkie.com/rankings> (reporting rankings for the following ten MMA weight classes: Men's Heavyweight, Men's Light Heavyweight, Men's Middleweight, Men's Welterweight, Men's Lightweight, Men's Featherweight, Men's Bantamweight, Men's Flyweight, Women's Bantamweight, and Women's Strawweight).

56. See <http://bleacherreport.com/articles/2661894-bleacher-report-mma-rankings-for-september-2016-ahead-of-ufc-203> (reporting rankings for the following ten MMA weight classes: Women's Strawweight, Men's Flyweight, Men's Bantamweight, Women's Batamweight, Men's Featherweight, Men's Lightweight, Men's Welterweight, Men's Middleweight, Men's Light Heavyweight, and Men's Heavyweight).

57. See <http://www.espn.com/mma/rankings> (reporting rankings for the following eight MMA weight classes Men's Heavyweight, Men's Light Heavyweight, Men's Middleweight, Men's Welterweight, Men's Lightweight, Men's Featherweight, Men's Bantamweight, and Men's Flyweight).

58. Singer Report ¶99, n. 268.

59. Topel Report ¶216.

60. Singer Report ¶¶97-98.

61. See, e.g., <http://www.fightmatrix.com/faq/> ("The rating system is division-adjusted, not division-specific. In other words, fighters carry their previous achievements with them to their new divisions..."). Conor McGregor

Indeed, no two Fighters are identical. But that does not imply that a hypothetical monopsonist over Headliners could not exercise monopsony power. To the contrary, it implies that the Headliner Submarket definition is conservative, and that Zuffa could profitably exercise monopsony power by controlling a smaller set of top Fighters than it actually controls. Dr. Topel also claims that the Headliner Submarket is “an inaccurate representation of top athletes,”<sup>62</sup> because Headliners often appear in bouts below the Top of the Card during the Class Period.<sup>63</sup> Again, even if it were correct, it would imply only that the Headliner Submarket definition is conservative, because the presence of Headliners below the Top of the Card indicates that a hypothetical monopsonist over only a subset of Headliners could profitably exercise monopsony power. Dr. Topel also claims that the Headliner Submarket definition is inaccurate because “among Zuffa athlete-events that were main event bouts in 2010-2016, 22 percent were not included in Dr. Singer’s ‘Headliners.’”<sup>64</sup> In other words, Dr. Topel has helpfully (to my analysis) shown that the Top of the Card was comprised of Headliners in nearly 80 percent of Zuffa events between 2010-2016. Moreover, at least one Headliner was at the Top of the Card in 91 percent of Zuffa events from 2010 to 2016. Dr. Topel fails to explain why a hypothetical monopsonist in control of the inputs necessary to stage 91 percent of Zuffa’s events during the Class Period could not exercise monopsony power. If anything, these statistics confirm my own conclusions regarding the Relevant Input Submarket.

24. My Ranked measure of the Relevant Input Market includes all Fighters encompassed by the Tracked measure plus any Fighter ranked higher than (or equal to) 650 in any

alone has fought in three different weight classes. McGregor fought in the Featherweight class in UFC 194, as a Welterweight in UFC 202, and as a Lightweight in UFC 205. See <http://www.ufc.com/event/UFC194>; <http://www.ufc.com/event/UFC-202>; <http://www.ufc.com/event/ufc-205>.

62. Topel Report ¶217.

63. *Id.*

64. *Id.*

of the fourteen MMA weight classes in the FightMatrix database, as well as the MMA Promotion ONE Championship.<sup>65</sup> The Ranked measure encompasses Fighters from hundreds of MMA promoters,<sup>66</sup> the vast majority (if not all) of which are what Zuffa has referred to as the “minor leagues” (in that they are literally and figuratively out of Zuffa’s league).<sup>67</sup> The Ranked measure of the Relevant Input Market is therefore extremely conservative. Dr. Topel offers no critiques specific to the Ranked measure of the Relevant Input Market,<sup>68</sup> nor do any of Zuffa’s economists.

25. My initial report explains that athletes from combat-oriented sports outside of MMA such as boxing and wrestling are outside the Relevant Input Market, as are athletes from non-combat sports such as football or hockey.<sup>69</sup> Dr. Topel not only makes no attempt to dispute this conclusion,<sup>70</sup> but he also essentially concedes its accuracy. For instance, during his deposition,

65. Singer Report ¶99.

66. *Id.* ¶111.

67. *Id.* ¶¶104-107 (explaining that even the most prominent MMA promoters were at best distant substitutes to Zuffa from the perspective of Fighters); *id.* ¶¶134-140 (explaining that market observers and participants viewed Zuffa as dominant; Zuffa’s current owners view the UFC as a sports league unto itself as NFL; Dana White declares “we’re the [expletive] NFL. Period. End of story.”). Dr. Topel admitted in his deposition that he’s aware of evidence that Zuffa considered certain MMA promotions to be “minor leagues.” *See* Topel Dep. at 376:25-377:7. Dr. Topel also compared “minor league” promotions to triple-A leagues in MLB “where athletes play either because they like playing or because they hope to make it to the major leagues.” *Id.* at 377:8-19. Dr. Topel also admitted that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa’s market share in either the input or output markets. *Id.* at 370:25-371:13. Dr. Topel also admitted that at the time they were purchased, none of the promotions that Zuffa acquired presented a significant economic threat to the UFC. *Id.* at 372:22-373:13. Similarly, Dr. Topel claims in his report that none of the MMA promotions that Zuffa has acquired, including relatively prominent promotions such as Pride and Strikeforce, had any substantial market power or share. Topel Report ¶172. By implication, if even the relatively prominent promotions that Zuffa thought enough of to acquire never seriously challenged Zuffa for share or power, it is unlikely that other MMA promotions were capable of doing so.

68. Dr. Topel does critique all three of my Relevant Input Market metrics for failing to account “for the competitive pressure created by the possibility of entry.” Topel Report ¶207. As explained in Part I.A.3 below, this critique is without merit.

69. Singer Report Part II.A.1.

70. Dr. Topel does include a single sentence stating that “there is a large potential supply of MMA athletes that a new promoter could employ...MMA athletes have come from, among other places, collegiate or Olympic wrestling or boxing programs, martial art academies, the military, and other professional sports.” Topel Report ¶65. This claim, even if true, would not demonstrate that a hypothetical monopsonist would have to control everything from Olympic wrestling to boxing to professional sports in order to exercise monopsony power, and Dr. Topel does not claim that it does. Instead, the claim is made with reference to entry barriers for potential MMA promoters. As explained in Part I.A.3 below, Dr. Topel fails to provide any meaningful support, beyond vague speculation, for his claim that entry

Dr. Topel admitted that it would not be easy for MMA fighters to switch to boxing.<sup>71</sup> None of Zuffa's other economists disputes my opinion in this regard.<sup>72</sup>

26. Significantly, Dr. Topel does not directly challenge my conclusion that Zuffa enjoys dominant shares in the market for MMA Fighter services, nor do any of Zuffa's economists. Indeed, Dr. Topel agrees that "Zuffa is larger than its rivals, has a larger share of top athletes, and is more successful at attracting audience share and revenue."<sup>73</sup> Dr. Topel also admitted: (1) that Zuffa is the market leader among MMA promoters and has been since 2001;<sup>74</sup> (2) that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa's market share in either the input or output markets;<sup>75</sup> (3) that at the time they were purchased, none of the promotions that Zuffa acquired presented a significant economic threat to the UFC;<sup>76</sup> (4) that he has no evidence that any of the Fighters who left Zuffa to fight for MMA rivals left against Zuffa's will;<sup>77</sup> and (5) that he cannot identify a single MMA fighter in history that left the UFC that Zuffa wanted to keep.<sup>78</sup>

barriers are low; to the contrary, he concedes that entry barriers are substantial, and that the challenged contracts themselves form such barriers.

71. Topel Dep. at 484:12-15. Dr. Topel was also unable to identify any MMA fighter other than Conor McGregor who became a successful professional boxer for more than one fight. *Id.* at 485:4-10. He also admitted that he has done no analysis of the costs or feasibility of a fighter switching from MMA to another sport. *Id.* at 486:1-12.

72. Boxing promoters Lou DiBella and Bob Arum testified that their boxing promotions do not "compete with MMA promoters in signing boxing prospects." DiBella Dep. at 32:13-16; Arum Dep. at 95:18-20. According to Mr. DiBella, boxing and MMA are "two different disciplines, as was just seen when Floyd Mayweather took it easy on Conor McGregor and still knocked him out, and I don't think that a good boxer is capable of beating a good MMA fighter in a MMA match. Nor do I think a good MMA fighter is capable of ... beating a good boxer in a boxing match." *Id.* at 71:9-22. See also Arum Dep. at 95:18-96:25; DiBella Dep. at 71:9-72:16.

73. Topel Report ¶96.

74. Topel Dep. at 363:13-364:3.

75. *Id.* at 370:25-371:13.

76. *Id.* at 372:22-373:13.

77. *Id.* at 393:3-11.

78. *Id.* at 397:12-18.

## **2. Relevant Output Market**

27. My initial report explains that Live MMA Events are a separate product market, that audiences do not view other combat sports (such as boxing or professional wrestling) to be reasonably close substitutes to Live MMA Events, and that Live MMA Events featuring Fighters outside the Relevant Input Market are not reasonable substitutes for Zuffa events.<sup>79</sup> My initial report also demonstrated that Zuffa's market share in the Relevant Output Market has been approximately 90 percent by revenue since at least 2008.<sup>80</sup> Dr. Topel makes no attempt to dispute these conclusions. Dr. Topel agrees that Zuffa "is more successful at attracting audience share and revenue" than other MMA promoters.<sup>81</sup>

28. With respect to the Relevant Geographic Market, during his deposition, Dr. Topel acknowledged that the market for Live MMA Events broadcast in Asia is separate from the market for Live MMA Events broadcast in the United States.<sup>82</sup>

## **3. Barriers to Entry**

29. As my initial report explains, artificial barriers to entry are those that rivals' seeking to compete with Zuffa face as a result of the Challenged Conduct.<sup>83</sup> Because the Challenged Conduct has denied rivals access to the Fighters necessary to compete effectively with the UFC, the Challenged Conduct is an artificial barrier to entry and expansion.<sup>84</sup> Neither Dr. Topel nor any of Zuffa's economists rebuts my conclusion that lack of access to a stable of high-quality Fighters is a barrier to entry and expansion. To the contrary, Dr. Topel conceded that Deutsche Bank was

79. Singer Report Part III.A.2.

80. *Id.* Part III.A.5.

81. Topel Report ¶96.

82. Topel Dep. at 494:16-24.

83. Singer Report ¶133.

84. *Id.* ¶133, ¶¶156-166, Parts III.C-III.D.

correct in observing that Zuffa having the vast majority of top fighters under multi-bout exclusive contracts created a barrier to entry for potential entrants to the MMA promotion market.<sup>85</sup> He conceded further that Deutsche Bank was also correct in observing that “[t]o effectively compete with the UFC a competitor would need proper infrastructure, substantial content to market upcoming fights, effective television distribution, *a deep lineup of marquee fighters*, and adequate resources to satisfy the costs of a UFC-level production.”<sup>86</sup>

30. Dr. Topel also opined that, by attracting and then locking-up in exclusive contracts “a significant share of the top athletes,”<sup>87</sup> an MMA promoter could perpetuate its market dominance. As he opines, “there is a *natural tendency* for a leading promoter to attract a significant share of the top athletes. This follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best[.]”<sup>88</sup> As a consequence of this market tipping, Dr. Topel acknowledges that “Zuffa is larger than its rivals, has a larger share of top athletes, and is more successful at attracting audience share and revenue.”<sup>89</sup>

85. Topel Dep. at 437:11-22 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM) (“So . . . having the vast majority of top fighters, whatever vast means there, under – under your contracts, whether they be multi-fight contracts or what, if people want to be there together, that creates a – an advantage, a competitive advantage that, all other things the same, make – an entrant’s going to have to overcome that in order to come in and compete head-to-head and have the same success as Zuffa.”).

86. Topel Dep. at 440:12-24 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM) (emphasis added). *See also id.* at 440:25-441:10 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM) (conceding that “[s]ubstantial capital would also be required for a competing organization to attract the talent necessary to stage a successful event. While good matchmaking from *a deep roster of talented fighters under contract is essential*”) (emphasis added).

87. Topel Report ¶96.

88. *Id.* (emphasis added). Dr. Topel testified: “So . . . having the vast majority of top fighters, whatever vast means there, under – under your contracts, whether they be multi-fight contracts or what, if people want to be there together, that creates . . . an advantage, a competitive advantage that, all other things the same, make – an entrant’s going to have to overcome that in order to come in and compete head-to-head and have the same success as Zuffa.” Topel Dep. at 437:11-22 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM).

89. Topel Report ¶96. Dr. Topel opines that “the most significant barrier to entry for MMA promoters” is “to get MMA regulated and sanctioned by state athletic commissions,” and that this barrier no longer exists as MMA is now sanctioned in all 50 states. *Id.* ¶24. This ignores his multiple concessions that the key entry barriers faced by other

31. Despite effectively conceding substantial and significant barriers to entry—including that the exclusive Fighter contracts themselves form such barriers—Dr. Topel nonetheless claims that my definitions of the Relevant Input Market and Submarket fail to account for “the competitive pressure created by the possibility of entry,”<sup>90</sup> given that, in his view, “barriers to entry are low.”<sup>91</sup> As “proof” of low entry barriers, Dr. Topel claims, without any supporting analysis, that there “is a large potential supply of athletes that a new promoter could employ,”<sup>92</sup> from “collegiate or Olympic wrestling or boxing programs, martial art academies, the military, and other professional sports.”<sup>93</sup> My initial report explained that the generalized fighting skills required for MMA competition are not seamlessly transferable with the more specialized skills required in (say) boxing, and that skills are even less transferrable between MMA and non-combat sports.<sup>94</sup> As explained above, Dr. Topel not only makes no attempt to dispute this conclusion; he essentially concedes its accuracy. In addition to admitting that it would not be easy for athletes to switch between MMA and boxing,<sup>95</sup> Dr. Topel admitted in his deposition that he has done no analysis of the costs or feasibility of a fighter switching between MMA and other sports.<sup>96</sup>

32. Dr. Topel provides no evidence that a potential MMA promoter entrant could compete effectively with Zuffa, much less provide the “rapid supply responses with direct

MMA promoters is lack access to a “a deep roster” of highly ranked, high-quality MMA Fighters. Dr. Topel also admitted that that Zuffa’s attorneys represented to the FTC in or about early 2012 that while the WWE and “high profile boxing promoters such as Golden Boy Promotions, Top Rank, and Gary Shaw Productions” were perfectly positioned to enter the market for MMA promotion, none of them ever did. Topel Dep. at 381:8-385:5 (discussing ZFL-1212232).

90. Topel Report ¶207.

91. *Id.*

92. *Id.* ¶207, n. 308; *id.* ¶65.

93. *Id.*

94. Singer Report ¶¶101-103

95. Topel Dep. at 484:12-15.

96. *Id.* at 486:1-12. Dr. Topel was also unable to identify any MMA fighter other than possibly Conor McGregor who became a successful professional boxer for more than one fight. *Id.* at 485:4-10.

competitive impact in the event of a SSNIP<sup>97</sup> that define rapid entry under standard antitrust principles. As a claimed example of “the speed with which new MMA promoters can get established in the marketplace,”<sup>98</sup> Dr. Topel states that a Russian MMA promoter (Absolute Championship Berkut) is “on track to promote 27 events in 2017” after promoting its first event in 2012.<sup>99</sup> But Berkut has promoted only a single, untelevised event in the United States, a second untelevised event in North America (Canada), and has no upcoming events scheduled in North America.<sup>100</sup> Thus, the vast majority of Berkut’s events (98 percent) have been outside the Relevant Geographic Market.<sup>101</sup> Moreover, none of Berkut’s events has been available via PPV in North America or broadcast on television in North America. Berkut has virtually no presence in the Relevant Geographic Market, and is hardly “established in the marketplace,” let alone a threat to Zuffa.

33. Dr. Topel also opines that the supposed “rapid expansion” of Bellator and Professional Fighters League (formerly WSOF)<sup>102</sup> demonstrates that barriers to entry and expansion are low.<sup>103</sup> But my initial report explains that none of Zuffa’s so-called rivals, including Bellator, has captured a significant share of the Relevant Output Market.<sup>104</sup> Neither Dr. Topel nor any of Zuffa’s economists rebut this conclusion. To the contrary, Dr. Topel agrees that “Zuffa is

97. Merger Guidelines §5.1.

98. Topel Report ¶72.

99. *Id.*

100. See <http://www.sherdog.com/organizations/Absolute-Championship-Berkut-8185> (accessed 12/6/2017). See also <https://www.tapology.com/fightcenter/events/43182-absolute-championship-berkut-51>, which shows that Absolute Championship Berkut’s only event in the United States was broadcast via “Internet Stream,” and <https://www.tapology.com/fightcenter/events/47826-acb-72-makovsky-vs-sherbatov>, which shows its second North American event in Canada was broadcast via “FITE App,” a smartphone application.

101. See <http://www.sherdog.com/organizations/Absolute-Championship-Berkut-8185>. (Accessed 12/6/2017).

102. Professional Fighters League “purchased the fighting operations and event infrastructure of the World Series of Fighting (WSOF) earlier this year [2017].” See *Professional Fighters League Announces World’s Only Mixed Martial Arts League*, PR NEWSWIRE, Apr. 19, 2017, available at: <https://www.prnewswire.com/news-releases/professional-fighters-league-announces-worlds-only-mixed-martial-arts-league-300441555.html>.

103. Topel Report ¶24.

104. Singer Report ¶131, Table 3.

larger than its rivals, has a larger share of top athletes, and is more successful at attracting audience share,”<sup>105</sup> and both Zuffa and other market observers view non-Zuffa MMA promoters as insignificant and ineffectual competitors.<sup>106</sup> Moreover, Zuffa’s own economists emphasize that Zuffa’s MMA rivals have consistently failed to achieve profitability.<sup>107</sup> Dr. Topel also opines that the “rapid expansion” of ONE Championship demonstrates that barriers to entry and expansion are low.<sup>108</sup> But as my initial report explains, ONE Championship is outside of the Relevant Geographic Market.<sup>109</sup> Dr. Topel acknowledges that the Asian market for MMA, where ONE competes, is a separate market from the North American market for MMA.<sup>110</sup>

#### **B. Zuffa’s Economists in No Way Undermine My Direct Proof of Zuffa’s Market Power**

34. In addition to indirect evidence of Zuffa’s market power, my initial report reviews direct evidence of Zuffa’s monopoly and monopsony power.<sup>111</sup> Direct proof simply requires evidence that Zuffa has in fact exercised monopoly or monopsony power or both. Product market definition is a tool to *infer* pricing power—that is, the ability to raise prices above competitive levels, or to suppress compensation below competitive levels. Because here we have direct evidence that Zuffa exercised monopoly and monopsony power, indirect evidence is of secondary importance.<sup>112</sup>

35. The direct evidence reviewed in my initial report includes direct evidence of Zuffa’s ability to (1) suppress Fighter compensation below competitive levels; (2) profitably raise

105. Topel Report ¶96.

106. Singer Report ¶¶134-138.

107. Blair Report ¶74; Davis Report ¶20. As explained in Part IV.A below, that other MMA promoters have sometimes failed to achieve profitability does not imply that the share of revenue that these rivals pay to their Fighters is an unreliable competitive benchmark.

108. Topel Report ¶24.

109. Singer Report ¶124.

110. Topel Dep. at 494:22-24 (“Q. The 90 percent figure is of the Asian MMA market; is that right? A. Yes.”).

111. Singer Report Part III.B

112. *Id.* ¶93.

prices for Live MMA Events; (3) restrict demand for Fighter services; (4) restrict supply of Live MMA Events; and, (5) exclude and impair potential rival MMA promoters.<sup>113</sup> This evidence allows me to conclude that Zuffa possesses and has exercised significant monopoly and monopsony power.<sup>114</sup> As explained below, Zuffa's economists in no way undermine these conclusions.

### **1. Power to Suppress Fighter Compensation**

36. My initial report presents multivariate regression models (the impact regressions) in which the dependent (left-hand-side) variable to be explained is the share of Event Revenue paid to a given Fighter at a given event (the wage share), while the key independent (right-hand-side) variable of interest is Zuffa's foreclosure share. In other words, I use a standard econometric method to assess whether Zuffa's increasing control over the market for professional MMA Fighters allowed Zuffa to suppress the share of Event Revenue that Zuffa paid to its Fighters (and increase the share of Event Revenue that Zuffa kept for itself and its owners). The results of that analysis demonstrate that, after controlling for a range of factors that affect the compensation of MMA Fighters (a total of 270 control variables, in addition to 1,396 Fighter "fixed effects"),<sup>115</sup> an increase in Zuffa's foreclosure share leads to an economically and statistically significant decrease in the share of Event Revenue paid to Zuffa Fighters.<sup>116</sup> This analysis confirms that the Challenged Conduct permitted Zuffa to suppress Fighter compensation, relative to the but-for world.<sup>117</sup> As explained in Part II below, Zuffa's economists' critiques of these regressions are without merit.

113. *Id.*

114. *Id.*

115. These fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.

116. Singer Report Part III.D.1.

117. *Id.*

The ability to suppress Fighter compensation below what would prevail under competition is monopsony power.<sup>118</sup>

37. Additional direct evidence that the Challenged Conduct suppressed Fighter compensation below competitive levels includes evidence that: (1) Zuffa has reduced the share of Event Revenue paid to Fighters over time (as the degree of foreclosure rose); (2) Zuffa pays Fighters a significantly lower share of its Event Revenue than did Strikeforce (before Zuffa acquired it) or Bellator; and (3) Zuffa unilaterally restricted compensation of its Fighters by profitably imposing a new sponsorship tax.<sup>119</sup> As explained below, Zuffa's economists' critiques of this evidence are without merit.

38. With respect to (1), Dr. Topel concedes that, as Zuffa's foreclosure share increased, the *share* of Event Revenue that Zuffa paid to its Fighters decreased.<sup>120</sup> But Dr. Topel maintains that Zuffa has not exercised monopsony power because the absolute *level* of Fighter compensation

118. Singer Report ¶212 ("This generalized suppression of compensation as the number and vitality of bidders for workers' services is reduced is just what is predicted by elementary economics, which shows that a monopsonist suppresses compensation to all of its labor inputs, just as a monopolist raises prices to all of its customers. Monopsony power is the mirror image of monopoly power; the harm to competition from monopsony is directly analogous to the harm from monopoly. A monopolist harms buyers by charging them a price above the competitive level; a monopsonist harms sellers by paying them a price below the competitive level"). *See also* DENNIS CARLTON & JEFFREY PERLOFF, MODERN INDUSTRIAL ORGANIZATION (Pearson 2005 4th ed.) [hereafter "Modern IO"] at 107-110; *see also* Merger Guidelines §1 ("Enhancement of market power by buyers, sometimes called 'monopsony power,' has adverse effects comparable to enhancement of market power by sellers. The Agencies employ an analogous framework to analyze mergers between rival purchasers that may enhance their market power as buyers"); *id.* §12; *Johnson v. Ariz. Hosp. & Healthcare Ass'n (AzHHA)*, No. CV 07-1292-PHXSRB, 2009 WL 5031334 (D. Ariz. July 14, 2009); *Vogel v. Am. Soc'y of Appraisers*, 744 F.2d 598, 601 (7th Cir. 1984) (stating that monopoly and monopsony are "symmetrical distortions of competition") (quoted in *Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co.*, 549 U.S. 312, 322 (2007)).

119. Singer Report Part III.D.2.

120. Topel Report ¶27 ("[Zuffa's] share of MMA fighters under contract rose while compensation as a share of event revenue declined.") (emphasis original); *see also* Topel Dep. at 50:6-51:2 ("Q. So would you agree that in general the share of UFC Event Revenue going to fighters did, in fact decline over time, say, from 2009 to 2016 even as fighter compensation measured in dollars per fight increased? A. .... I think the evidence is that fighter compensation increased at a different rate, a . . . somewhat lower rate than the increase in revenues so that the ratio would be lower .... The ratio of fighter compensation to total event revenue . . . was on average lower as those revenues increased."); *id.* at 250:11-251:7 (discussing ZFL-1484034-37) (admits that fighter share of revenue decreased after Zuffa purchased Strikeforce in 2010); *id.* at 252:1-16 (admits that fighter share of revenue decreased after Zuffa purchased WFA, WEC, and Pride in 2007) (discussing ZFL-1484034-37).

has increased over time.<sup>121</sup> Dr. Topel's analysis contradicts basic economic logic. According to elementary economics, labor in a competitive market receives compensation equal to its MRP, defined as the dollar value of what a worker produces (holding all other inputs constant).<sup>122</sup> When the labor market is not competitive, employers exploit their monopsony power to pay workers less than workers' MRP.<sup>123</sup> Therefore, even under a monopsony, labor receives a percentage of its MRP, and the compensation paid to labor will increase when workers' MRP increases, all else equal.<sup>124</sup>

39. As a consequence, Dr. Topel is incorrect to conclude from the simple fact that compensation increases over time that Zuffa cannot be exercising monopsony power.<sup>125</sup> Dr. Topel backtracked from this untenable position at his deposition, where he conceded that if all one knew about a firm was that worker compensation increased over time, one could *not* determine whether the firm was or was not exercising monopsony power.<sup>126</sup> Consider an analogy from a seller's perspective: It would be wrong to assert that so long as prices are declining, a firm cannot be exercising monopoly power; it is possible for marginal costs to fall at a faster rate than prices,

121. Topel Report ¶¶169-171.

122. MICHAEL KATZ & HARVEY ROSEN, MICROECONOMICS at 312-315 (Irwin McGraw-Hill 3rd ed. 1998) [hereafter "KATZ & ROSEN"]. See also RODNEY D. FORT, SPORTS ECONOMICS 206 (Prentice Hall 3rd ed. 2011) [hereafter, "Fort Sports Econ"] ("In a competitive talent market, we expect that players get paid pretty close to their MRP."); ROBERT S. SMITH, 61 MODERN LABOR ECONOMICS: THEORY AND PUBLIC POLICY (9th ed. 2006) ("For example, if the presence of a tennis star increases attendance at a tournament by 20,000 spectators, and the organizers net \$25 from each additional fan, the marginal income produced by this star is equal to her marginal product (20,000 fans) times the marginal revenue of \$25 per fan. Thus, here marginal revenue product equals \$500,000.").

123. See, e.g., ROGER BLAIR, SPORTS ECONOMICS 354 (Cambridge University Press 2012) [hereafter, "Blair Sports Econ"] (explaining that, when professional athletes are paid less than their MRP, "[t]his is *exploitation* in the sense that the player is paid less than his value to the club") (emphasis in original).

124. Dr. Topel conceded that even a monopsonist pays its workers in relation to, albeit lower than, their MRP. See Topel Dep. at 21:11-15 (admitting that "over some period of time, all things equal, when a firm's marginal revenue product of its workers rises, a firm with monopsony power will pay its workers more"); *id.* at 21:4-15 (admitting that, all things equal, increase in MRP leads a monopsonist to increase compensation); *id.* at 22:18-23 (admitting that, all things equal, decrease in MRP leads a monopsonist to decrease compensation).

125. Topel Report ¶169.

126. See Topel Dep. at 58:15-20 (admitting that "[y]ou would need to know more" than the mere fact that compensation was rising to determine whether monopsony power was or was not being exercised).

leading to even larger markups over costs. The same logic holds for a monopsonist. To illustrate, suppose that the MRP of labor doubles from one year to the next, but that wages increase by only ten percent over the same time period. Because workers are paid more in absolute terms, by Dr. Topel's (faulty) logic in his report, monopsony power has not been exercised, and compensation is competitive. That is obviously wrong: Workers are generating 100 percent more revenue than they did one year ago, but are given a raise equal to just one tenth of that increase. That, by definition, reflects the exercise of monopsony power.<sup>127</sup>

40. Relatedly, Dr. Topel claims falsely that my initial report did not "examine what Zuffa has actually paid its athletes over time."<sup>128</sup> In fact, my initial report demonstrated that increases in Fighter compensation over time have been swamped by increases in Zuffa's Event Revenue per Fighter, indicating that Fighter compensation has failed to keep pace with increases in Fighter productivity—a clear indication of the exercise of monopsony power.<sup>129</sup> More generally, my impact regressions control for Zuffa's increasing revenues by measuring Fighter compensation as a percentage of Event Revenue, and also control for a range of additional factors affecting Fighter pay. The results of those analyses demonstrate that, holding other factors constant, an increase in Zuffa's foreclosure of the Relevant Input Market and/or Submarket leads to an economically and statistically significant decrease in the share of Event Revenue paid to Fighters, indicating that the Challenged Conduct permitted Zuffa to suppress Fighter compensation substantially relative to the but-for world.<sup>130</sup>

127. See *id.* at 17:18-22 (admitting that "labor in a competitive market receives compensation equal to its marginal revenue product in competing uses").

128. Topel Report ¶169.

129. Singer Report ¶¶271-272.

130. *Id.* Part III.D.1.

41. My initial report explained that Zuffa used a “sponsorship tax” to divert sponsorship revenue to Zuffa and away from Fighters, and that Zuffa’s profitable imposition of the sponsorship tax demonstrates Zuffa’s ability to restrict Fighter compensation unilaterally, and thus its market power.<sup>131</sup> Dr. Topel claims that this conclusion is not “established by the evidence,”<sup>132</sup> and that “Zuffa’s intent was to use the brand affiliation program to grow the sport of MMA to the benefit of its athletes.”<sup>133</sup> Dr. Topel provides no analysis to support this claim; he simply cites to testimony from a Zuffa executive, Denitza Batchvarova, suggesting that Zuffa believed it would “lose money” as a result of its new sponsorship policies,<sup>134</sup> as well Dana White’s boast at a press conference that “the fighters would receive every last penny from the uniform deal.”<sup>135</sup> Dr. Topel simply accepts at face value Zuffa’s implausible claim that it voluntarily entered into a money-losing arrangement simply to benefit Fighters. But Batchvarova’s testimony makes clear that Zuffa expected to profit from its new sponsorship policies once it signed a new licensee to place on its Reebok uniform.<sup>136</sup> Record evidence reviewed in my initial report indicates that Fighters were made worse off as a result of the sponsorship tax, which required sponsors to pay Zuffa for the right to sponsor Fighters. This caused Fighters to lose sponsorship revenue, given that many sponsors could not afford to pay the new Zuffa tax.<sup>137</sup> In addition to driving many small companies away from sponsoring their chosen Fighters, the sponsorship tax also forced the sponsor to

131. *Id.* ¶35, ¶¶191-192.

132. Topel Report ¶240.

133. *Id.* ¶241

134. *Id.* ¶241 (citing deposition testimony from UFC Senior Vice-President of Strategy Denitza Batchvarova).

135. *Id.* ¶241, n. 346.

136. Batchvarova Dep. at 139:17-24 (“I will say that … the numbers that we used to determine the break-even was looking at all revenue that we had visibility into the time including some limited sponsorship revenue. I believe what Lorenzo was referring to was essentially a sponsorship deal … for this asset would be worth a lot more than a million dollars.”); *see also* ZFL-0997885 (Batchvarova Ex. 95) at 887 (“UFC can either retain all incremental revenue or share a percentage with the fighter. Zuffa would look to generate a meaningful profit in a second deal on Project Next.”).

137. Singer Report ¶35, ¶¶191-192.

negotiate directly with Zuffa, bypassing the Fighter entirely.<sup>138</sup> Additional record evidence confirms that Fighters lost money as a result of Zuffa's imposition of the sponsorship tax. Dean Albrecht, a Fighter manager, wrote to UFC's Assistant General Counsel Michael Mersch that his Fighters were losing revenue from dropped sponsors.<sup>139</sup> Other managers noted similar impacts on their Fighters.<sup>140</sup> Nick Ciubotariu of Rupture Clothing wrote to Dana White that the sponsorship tax "would...hurt the UFC fighters we sponsor and would unfortunately drive our business elsewhere."<sup>141</sup> Another sponsor wrote to Mersch that his company would cease to sponsor Fighters as a result of the sponsorship tax.<sup>142</sup> Zuffa itself recognized the negative financial impact of its sponsorship policies on Fighters.<sup>143</sup> Even evidence cited by Dr. Topel confirms that Fighters were harmed by Zuffa's sponsorship policies. One article Dr. Topel references states that "the loss of

138. *Id.* ¶191.

139. ZFL-2242629 (Dean Albrecht (fighter manager) to Mersch: "[T]he guys lost out on about \$4k each and bisping about \$5k but it is what it is. ... I lost a \$8000 sponsorship for Tyson this week due to the banning as well... ouch... so I am trying to replace it. And I have a several hundred thousand dollar deal for Rampage with Cagefighter. I made him stop the deal with Affliction when I started working with him and now this with cage fighter.").

140. ZFL-0876778 (Auddie Attar (fighter manager) to Silva: "The kid made \$15k in local sponsors for the last fight... While I'm all for Reebok and I'm all for rewarding tenure, we need to have a professional and open conversation on how the fighter can earn that lost per fight sponsorship revenue. (i.e. greater win bonus, or adding a finish bonus, etc.). Also, I know you had no personal involvement in the removal of outside sponsors, or even the % of the Reebok revenues allocated to fighters. However, the reality is the economic dynamic for a current fighters' total fight earnings has changed and they are going to lose money."). See also ZFL-2535978 (Manos Terzitane (fighter manager) to Mersch: "Sweden is a tiny market, Alexander does not have a lot of money to work with. The above mentioned websites don't make a lot of money either, but the little they do they put towards fighters to make it abroad. If you persist on this matter, Alexander will have to pay back the sums he's received that made it possible for him to fly to the US and train with top level fighters for this fight so he can be in the best shape of his life. It will be devastating for him."); ZFL-2699687 (Text messages between Dana White and MMA Fighter Myles Jury, who states: "The overall problem, I'm getting 6 figure [sic] in sponsors (without Reebok). I'm losing them without being able to have logos on sponsors. This reebok deal + UFC pay + uniform pay, totals me losing a ton of money... This is some scary shit.").

141. ZUF-00337760.

142. ZFL-2253232 (Yancy Lawhorn (MMA Overload) to Mersch: "Unfortunately \$50k is more than the total I spent on all advertising last year with google, yahoo and sponsored fighters. At this time it is too much for me to continue to sponsoring fighters.").

143. ZFL-2699678 (text messages among Zuffa executives discussing negative effect of sponsorship policies on Fighter Vitor Belfort). See also ZFL-1009561 (Mersch to Gold, cc'ing Sterret, Epstein, Mossholder, and Fertitta: "Talked with Moss and Reid yesterday and the group consensus was we need to get this in front of Lorenzo first before we take out this product category as there will be fighters that will be impacted financially by such a decision.").

individual sponsors would cause a ripple effect that damaged relations with *all fighters*,<sup>144</sup> and notes that “many unsatisfied fighters [are] looking for a way to keep competing while simultaneously not losing out on sponsorship money[.]”<sup>145</sup> Another article cited by Dr. Topel lists the “sponsorship money losses in the wake of the Reebok deal,”<sup>146</sup> and the “restrictive sponsorship deal signed between the UFC and Reebok,”<sup>147</sup> among various factors driving Fighter discontent with the UFC. In sum, my analysis was correct: Zuffa’s imposition of the sponsorship tax is clear evidence of its ability, to profitably cause its Fighters to suffer a substantial decrease in compensation—that is, of Zuffa’s monopsony power.

## **2. Restricted Supply of Fighter Services**

42. My initial report also reviewed record evidence indicating that Zuffa had consistently maintained significantly more Fighters under contract than it could use, creating forced periods of inactivity during which Fighters were not paid and were not available to other MMA promoters to fight.<sup>148</sup> This evidence is consistent with basic monopsony theory, according to which a firm with monopsony power pushes compensation below competitive levels by restricting employment below competitive levels.<sup>149</sup> It is also consistent with a monopsonist seeking to exclude and impair rivals by depriving them of a key input.<sup>150</sup> Dr. Topel claims that this

144. Teddy Montemayor & John Bieschke, *How the UFC and Reebok Changed the Sponsorship Landscape in MMA*, MMA NEWSLINE, Jan. 9, 2017 (emphasis added) (cited at Topel Report ¶243, n. 348).

145. *Id.*

146. Mike Chiappetta, *The Grass Is Greener: UFC-to-Bellator Signees Speak Out*, BLEACHER REPORT, Apr. 5, 2016, available at <http://bleacherreport.com/articles/2630256-the-grass-is-greener-ufc-to-bellator-signees-speak-out> (cited at Topel Report ¶243, n. 348).

147. *Id.*

148. Singer Report Part III.D.3.

149. Modern IO at 107-110.

150. See, e.g., Steven Salop, *The Flawed Incremental Price-Cost Test*, 81 ANTITRUST L.J. (2017) [hereafter, “Salop (2017)”]

conclusion is “contradicted by the deposition testimony of Zuffa witnesses in this case,”<sup>151</sup> and references the deposition transcript of Mr. Joseph Silva.<sup>152</sup> But as explained in my initial report, Mr. Silva testified that, from at least 2010 to 2015, he had “been complaining to managers and fighters and others” that Zuffa “had more fighters under contract than [Zuffa] had fights to give them.”<sup>153</sup> Mr. Silva also testified that he kept Fighters under contract whom he otherwise would have cut, because he wanted to keep these Fighters away from Bellator.<sup>154</sup> Dr. Topel also cites to the depositions of Mr. Shelby and Mr. Hendricks to support his claim that “Zuffa constantly faces challenges due to athlete unavailability and replacing athletes on a fight card is costly.”<sup>155</sup> To the contrary, the deposition transcripts of Zuffa’s own employees indicate that it was very unusual for Zuffa to have to cancel an event for lack of available fighters.<sup>156</sup>

43. My initial report also reviewed evidence that Zuffa pursued a deliberate strategy of restricting the number of career paths available to Fighters.<sup>157</sup> None of Zuffa’s economists addresses this evidence.

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151. Topel Report ¶244.

152. *Id.*, n. 351 (citing to Silva Dep. at 120:16-121:20).

153. Silva Dep. at 257:8-15 (“Q. So just from the last series of e-mails and texts, . . . is it fair to say that at least from 2010 to 2015 you had been complaining to managers and fighters and others that you had more fighters under contract than you had fights to give them? . . . Q. Is that fair? A. Yeah.”).

154. Mr. Silva explains in an email that he “would love to cut [fighter Rogerio Nogueira] but he would just end up fighting [former UFC champion] Rampage in Bellator.” Silva testified that cutting Nogueira “would just be handing [Bellator] something easy . . . [a] [c]redible name.” Silva Dep. at 304:18-306:12. *See also* Silva Ex. 28. Zuffa elected not to cut Nogueira. Silva Dep. at 307:4-7. Silva also admitted that if Nogueira had been matched against Rampage Jackson, this would “improve Bellator’s ability to put on a successful event.” *Id.* at 307:19-308:2.

155. Topel Report ¶244 (citing Shelby Dep. at 120; Hendrick Dep. at 181-82).

156. Mr. Shelby testified that “there are times where I’ve got a lot of fighters who need fights immediately, and then there’s times where I don’t have any fighters that I can put in a match and then it allows me to sign another fighter.” Shelby Dep. at 120:12-16; *see also id.* at 212:23 – 231:18. Mr. Hendrick testified that it was unusual for the UFC to have to cancel an event for lack of available Fighters, and that the UFC could usually find replacements even for last-minute cancellations. Hendrick Dep. at 181:14-182:7 (“Q. How many times has the UFC had to cancel an event? A. I can’t swear to it, but it seems like just a couple, not a lot.”).

157. Singer Report ¶196 (citing Jesse Baker & Matthew Thomson, *The Ultimate Fighting Championships (UFC): The Evolution of a Sport*, in CASES IN MARKETING MANAGEMENT 114 (SAGE Publications, Kenneth E. Clow & Donald Baack, eds., 2011)).

### 3. Power Over Price and Power to Restrict Supply of Live MMA Events

44. My initial report presented direct evidence of Zuffa's power to restrict price and output,<sup>158</sup> including evidence that, between 2010 and 2015, Zuffa implemented a profitable price hike of 24 percent for residential PPV events while restricting output by 17 percent.<sup>159</sup> Because the supply of PPV events from other MMA promoters was negligible during this time period, this implies that residential PPV output for the industry overall was also restricted.<sup>160</sup> Dr. Topel concedes that residential PPV output was indeed restricted by 17 percent,<sup>161</sup> and that residential PPV prices increased over the same interval.<sup>162</sup> Dr. Topel does not dispute the numerical accuracy of my pricing calculations, which show that Zuffa's average PPV revenue per residential consumer—by definition, the residential PPV price from the perspective of Zuffa—increased by 24 percent.<sup>163</sup> Instead, he claims that the calculations “do not reveal the prices that consumers actually paid,”<sup>164</sup> given that residential customers purchase PPV events from cable companies and other PPV distributors, and not directly from Zuffa.<sup>165</sup> Dr. Topel claims my calculations are “misleading” because the retail PPV price increased by 11 percent, rather than 24 percent.<sup>166</sup>

45. Dr. Topel is wrong. The 11 percent figure represents Zuffa's price hike expressed as a percentage of the *total retail PPV price* (which is split between Zuffa and PPV distributors). The 24 percent figure is the same price hike expressed as a percentage of *Zuffa's average revenue per*

158. Singer Report Parts III.D.4-5.

159. *Id.* ¶¶200-203.

160. Topel Report ¶258, n. 379 (“It is my understanding that rival promoters rarely made their events available on PPV.”).

161. *Id.* ¶251 (“. . . he [Dr. Singer] is correct that there was a reduction between 2010 and 2015 in total PPV buys. In 2010, Zuffa held 15 events that were available on PPV and sold 7.7 million residential buys. In 2015 Zuffa sold 6.4 million residential buys over 13 events”).

162. *Id.* ¶248.

163. Singer Report ¶201, n. 498.

164. Topel Report ¶248.

165. *Id.*

166. *Id.*

*residential PPV customer*—that is, only the portion of the retail price that accrues to Zuffa. My initial report uses the 24 percent figure because that is what is relevant for determining whether Zuffa could profitably exercise market power. Zuffa’s profitability is determined by its own revenues—not those of PPV distributors. From Zuffa’s perspective, PPV distributors are its direct customers. In any case, Dr. Topel does not dispute that Zuffa’s residential PPV revenue increased over the same interval that its residential PPV output fell by 17 percent.<sup>167</sup> This implies that the demand response to Zuffa’s price hike was inelastic, which implies further that the price hike was profitable for Zuffa.<sup>168</sup> The power to implement a substantial profitable price hike above competitive levels is direct evidence of the exercise of market power.

46. Dr. Topel also opines that Zuffa’s price hike is overstated because “prices for cable and satellite television services increased by 17 percent”<sup>169</sup> over the interval of Zuffa’s PPV price hike. The premise of this argument is that the cable/satellite services price hike was competitive, and so a slightly higher price increase by Zuffa is competitive too. But Dr. Topel’s argument wrongly assumes that the retail prices charged by cable and satellite television providers in highly concentrated markets do not themselves reflect the exercise of market power.<sup>170</sup> Similarly, Dr. Topel’s use of price indices for “Sporting Events”<sup>171</sup> and “Movies, Theaters, and Concerts”<sup>172</sup> baselessly assumes that market power is absent in these industries as well. That Zuffa was able to

167. Singer Report ¶201.

168. Katz & Rosen at 78-79.

169. Topel Report ¶249.

170. See, e.g., Gregory S. Crawford, *Cable Regulation in the Internet Era*, Chapter 3 in NANCY L. ROSE, ED., ECONOMIC REGULATION AND ITS REFORM: WHAT HAVE WE LEARNED? 174-75 (University of Chicago Press 2014) (“Are (most) cable markets competitive? The evidence for wireline competition is encouraging, but its narrow scope (pre-telco entry) has limited measured benefits to a small fraction of cable households and lack of data (post-telco entry) renders conclusions impossible. While there is some evidence of a positive impact of satellite competition on cable prices, the estimated cable price elasticities suggest *cable systems still exert considerable market power*. Despite this, more large-scale entry appears unlikely. Further wireline entry means paying substantial fixed costs and facing entrenched competitors.”) (emphasis added).

171. Topel Report ¶249, n. 362.

172. *Id.*

raise prices higher and faster than other industries where substantial market power is potentially present is, if anything, further evidence of Zuffa's market power. Dr. Topel claims further that Zuffa's price increase may have been driven by "benign factors,"<sup>173</sup> such as increases in demand or costs, and claims that Zuffa's PPV advertising expenses increased by 900 percent from 2010 to 2015.<sup>174</sup> Dr. Topel's 900 percent figure reflects a miscalculation; in reality, Zuffa's PPV advertising expenses *declined* from 2010 to 2015.<sup>175</sup> Dr. Topel's claim that Zuffa's price hike was the result of an outward shift in demand is contradicted by the fact that Zuffa's PPV output fell (an outward shift in demand increases the market quantity).<sup>176</sup> Moreover, even if Zuffa's PPV price hike were the result of "benign factors,"<sup>177</sup> as Dr. Topel claims, the evidence would still indicate that the demand for Zuffa's PPV events is inelastic, which implies substantial market power.

47. My initial report also demonstrated that the output of Live MMA Events generally has fallen since 2010, both in absolute terms and relative to prior trends, because the output of Live MMA Events by non-Zuffa promoters has fallen off sharply, and Zuffa's supply of Live MMA Events did not increase by enough to make up for the difference.<sup>178</sup> Dr. Topel opines that "there is no reason why a more mature market that existed after 2010 would grow at the same high rate as when the market was just starting out."<sup>179</sup> But Dr. Topel ignores that the total supply of Live MMA Events decreased in absolute terms, and not just relative to the pre-2011 trend.<sup>180</sup> Dr. Topel does not attempt to explain or offer any procompetitive reason why the supply of Live MMA

173. *Id.* ¶32.

174. *Id.* ¶250.

175. Dr. Topel mistakenly compared PPV advertising expenses for a single month in 2010 to a full year's worth of expenditures in 2015.

176. Katz & Rosen at 64-70.

177. Topel Report ¶32.

178. Singer Report ¶¶203-206.

179. Topel Report ¶253.

180. Singer Report Figures 4A-4C.

Events would *shrink* in a “mature” MMA market. To the contrary, it is apparently his expectation that output was indeed expanding, in claiming (incorrectly) that “Zuffa’s market-expanding strategy and investments have... increased the number and variety of MMA events available to consumers, and viewership... during the class period.”<sup>181</sup> Further, the notion that the MMA Promotion market is “mature” (and thus that we should expect slowing growth) is unsupported given its relative novelty as a major league sport, especially when compared with other established professional sports like baseball, basketball, hockey, football, soccer, and boxing, which have existed for many decades (or, in the case of baseball, well over a century). It is therefore reasonable to expect that, absent the Challenged Conduct, total output of MMA Live Events would have continued to grow.<sup>182</sup>

48. Dr. Topel presents data on attendance at Live MMA Events, as well as PPV viewership and non-PPV television viewership.<sup>183</sup> The attendance data show that total attendance at Live MMA Events (in terms of seats) decreased as well, from 647,857 in 2010 and 741,229 in 2011 to 606,463 in 2015.<sup>184</sup> Similarly, Dr. Topel’s PPV viewership data show that PPV viewership (in terms of buys) also declined, from 7,707,123 in 2010 and 6,848,000 in 2011 to 6,412,699 in 2015.<sup>185</sup> These data are, of course, consistent with my own conclusion that the total supply of Live MMA Events has fallen over this timeframe, consistent with the exercise of market power by Zuffa.

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181. Topel Report ¶23.

182. [REDACTED]

183. Topel Report ¶¶257-258, Exhibits 30-31.

184. *Id.* Exhibit 30.

185. *Id.* Exhibit 31.

49. If Dr. Topel's viewership data for non-PPV events are included, and if PPV and non-PPV viewership are weighted equally, the data indicate that total viewership increased from 2010 and 2011 to 2015, but decreased from 2013 to 2015, as output from both Zuffa and non-Zuffa promoters fell.<sup>186</sup> However, it is clearly incorrect to weight non-PPV viewership identically to PPV viewership: *First*, Dr. Topel's PPV data are measured as PPV buys, and therefore underestimate viewership whenever more than one individual views an event purchased by a single individual or business. *Second*, PPV events are higher-value events than non-PPV events.<sup>187</sup> To correct for this, I recalculated total viewership, weighting Dr. Topel's viewership metrics based on the revenue that Zuffa earns from each, relative to one another. These weighted output statistics confirm again that total industry output—as measured by aggregate viewership of PPV events, non-PPV events, and live event attendance—declined in absolute terms from 2011 to 2015 (the last year for which complete data are available); moreover, average annual output from 2011 to 2015 was less than in 2010.

#### **4. Power to Exclude Rivals**

50. My initial report explains that Zuffa guaranteed that would-be rivals could not pose a significant competitive threat by denying them access to a broad stable of high-quality MMA Fighters, a critical input to staging successful Live MMA Events.<sup>188</sup> Some rivals were acquired by Zuffa, others went out of business, and others were relegated to feeder leagues.<sup>189</sup> Both Zuffa and third parties recognize that the Challenged Conduct has been so successful in excluding rivals that

186. *Id.* Exhibit 31.

187. See, e.g., WME-ZUFFA-0001150, at 10 (showing consistently higher event ticket pricing for PPV events, compared with non-PPV events).

188. Singer Report Part III.C.1

189. *Id.* Parts II.A.1, III.A.1, III.A.8.

throughout the Class Period Zuffa has had no close competitors in the Relevant Output Market.<sup>190</sup>

The revenues and market shares of other MMA promoters have been throughout the Class Period trivial in comparison to those of Zuffa.<sup>191</sup>

51. As explained in Parts I.A.2-3 above, neither Dr. Topel nor any of Zuffa's economists disputes my conclusion that Zuffa's supposed MMA rivals have failed to capture a significant share of the Relevant Output Market, or that Zuffa's share in the Relevant Output Market is significant; to the contrary, Zuffa's economists have emphasized that potential MMA rivals have failed consistently to achieve viability or profitability.<sup>192</sup>

52. Dr. Topel claims that Zuffa does not have the power to exclude rivals because "barriers for MMA promoters to enter the market are low,"<sup>193</sup> and because Zuffa "has faced and continues to face vigorous competition in the marketplace."<sup>194</sup> As explained in Part I.A.3 above, Dr. Topel's claims regarding barriers to entry are without merit, and are contradicted by Dr. Topel himself at deposition. Indeed, Dr. Topel repeatedly conceded that Zuffa imposed substantial (artificial) entry barriers, including in particular those barriers imposed by the Challenged Conduct itself. Moreover, Dr. Topel's supposed evidence of "vigorous competition" consists of the same MMA promoters that have failed to achieve significant market share or to achieve consistent profitability, as well as MMA promoters outside of the Relevant Geographic Market.

190. *Id.* Parts III.A.1, III.A.4-5, III.A.8.

191. *Id.* Parts III.A.4-5.

192. Dr. Topel admitted in his deposition that none of the competitors acquired by Zuffa achieved a significant market share and asserted that Zuffa's market share has been stable over time. *See* Topel Dep. 368:13-17 ("Q. So all of the acquisitions together, in your understanding, did not appreciably change Zuffa's market share in either the input or output market; is that what you're saying? A. Yes."). *See also id.* at 370:25-371:13 ("Q. Is it fair to say that none of the competitors that Zuffa purchased that you identified in paragraph 173, in your view, had been able to challenge Zuffa's dominance in either the input or output markets? ... A. Well, I don't know what it means to challenge dominance. I've seen dominance used in the context that noneconomists would use it. Zuffa has a level of market share in a position in the market. ... It's been pretty stable over time.").

193. Topel Report ¶259.

194. *Id.*

**C. Zuffa's Economists Do Nothing to Undermine My Conclusion That the Challenged Conduct Substantially Foreclosed Competition**

53. After establishing with both indirect and direct methods that Zuffa has substantial market power, my initial report demonstrates that Zuffa exercised that market power to substantially foreclose competition through the Challenged Conduct.<sup>195</sup> My initial report showed that the shares of the Relevant Input Market and Submarket that the Challenged Conduct foreclosed are well in excess of the 20 to 30 percent thresholds that antitrust scholars have found sufficient to infer anticompetitive effects.<sup>196</sup> My initial report also demonstrated that the increasing share of top professional MMA fighters under exclusive contract with Zuffa, combined with both the duration and staggering of those contracts, and with Zuffa's coercive efforts to ensure that such contracts were effectively perpetual,<sup>197</sup> prevented meaningful competition.<sup>198</sup> As explained below, Zuffa's economists fail to undermine these conclusions, and indeed in many respects bolster them.

**1. Dr. Topel's Critiques of My Foreclosure Calculations Are Without Merit**

54. My initial report demonstrates that the Challenged Conduct blocked Zuffa's potential rivals from access to a deep pool of talented Fighters, thereby foreclosing substantial competition. As my initial report establishes, a critical mass of top-level Fighters are a crucial input to an MMA promoter seeking to challenge Zuffa's dominance in the current market environment. The importance of such a critical mass of top-level Fighters is significant given, among other things: (1) the need for a steady supply of appropriately matched Headliners to occupy the top of a Fight Card in order to ensure that an MMA Event is capable of generating substantial revenues; (2) the inherent uncertainty in predicting which Fighters would be capable of

195. Singer Report Part III.C.

196. *Id.* Part III.C.2.

197. *Id.* Part III.C.4.

198. *Id.* Part III.C.3.

doing so (and available to do so) at any given point in the future, and of which Fighters are likely to become Headliners in the future; and (3) the need to replace Fighters who become unavailable due to injury, retirement, and so on.<sup>199</sup> To compete effectively in a world in which the dominant player (Zuffa) refused to co-promote MMA events, an MMA promoter seeking to challenge Zuffa must have the ability to match one Headliner against another in multiple weight classes, and this requires access to a broad stable of Headliners from which to create competitive matches. Because Fighters' relative rankings shift constantly, access to a sufficiently broad pool of top-level Fighters (with the potential to become Headliners) is also important. Accordingly, ongoing access to a deep pool of talented Fighters is a critical input to the ongoing success of an MMA promotion—especially one seeking to challenge Zuffa—in a competitive environment where the dominant promoter refuses to co-promote MMA events.<sup>200</sup>

55. Dr. Topel claims that “it is unclear why promoters need ‘a critical mass of top-level Fighters’ at one time,” and criticizes me for supposedly failing to define “critical mass.”<sup>201</sup> But my initial report did define critical mass, developed various foreclosure metrics with which to measure it,<sup>202</sup> and used these foreclosure metrics (in the context of my impact regression) to demonstrate that Zuffa’s foreclosure of this critical input allowed it to exercise monopsony power.<sup>203</sup> My initial

199. *Id.* III.C.1.

200. *Id.* ¶¶156-158. See also DB-ZUFFA-00006389 at 439 (“In order for a competing MMA organization to generate revenues comparable to UFC, the organization must be willing to invest significant capital in order to build the distribution network required to promote and broadcast major events, as well as create or acquire sufficient content to effectively market such events. Substantial capital would also be required for a competing organization to attract the talent necessary to stage a successful event, while *good matchmaking from a deep roster of talented fighters under contract is essential*..... Any organization intent on building a promotion to directly rival UFC would likely be immediately challenged to build and maintain the infrastructure of employees and fighters on a profitable basis”); see also Topel Dep. at 440:25-441:10 (agreeing with Deutsche Bank statement that “deep roster of talented fighters under contract is essential” to the success of an MMA promotion).

201. Topel Report ¶118.

202. Singer Report Part III.C.2.

203. *Id.* Part III.D.1.

report also reviewed extensive record evidence,<sup>204</sup> confirming that both Zuffa and third-party analysts recognized just how critical “a deep lineup of marquee fighters”<sup>205</sup> is for a successful MMA promotion. Moreover, Dr. Topel himself recognizes that “[t]here is a natural tendency for a leading promoter to attract a *significant share* of the top athletes,”<sup>206</sup> which “follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best.”<sup>207</sup> Thus, Dr. Topel and I use the terms “significant share” and “critical mass” to describe the same phenomenon. As Dr. Topel explained in his deposition largely agreeing with a statement by Deutsche Bank on the significance of Zuffa’s having “the vast majority of top fighters” under contract to the ability of other MMA promoters to compete:

So . . . having the vast majority of top fighters, whatever vast means there, under – under your contracts, whether they be multi-fight contracts or what, if people want to be there together, that creates . . . an advantage, a competitive advantage that, all other things the same, . . . an entrant’s going to have to overcome that in order to come in and compete head-to-head and have the same success as Zuffa.<sup>208</sup>

56. The foreclosure metrics developed in my initial report are designed to measure the share and relative importance to an MMA promotion of the Fighters in the Relevant Input Market (and Submarket) that Zuffa had locked up in long-term exclusive contracts.<sup>209</sup> As a part of this process, I measure the pool of Fighters who were active around the time of a particular Live MMA Event; the pool of active Fighters is defined as Fighters who participated in a Live MMA Event within nine months before or after the Live MMA Event in question.<sup>210</sup> This method therefore

204. *Id.* Part III.C.1.

205. ZUF-00162329, at 371 (October 2009 Deutsche Bank CIM).

206. Topel Report ¶96 (emphasis added).

207. *Id.*

208. Topel Dep. at 437:11-22 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM).

209. Singer Report Part III.C.2.

210. *Id.* ¶308. As always, only Live MMA Events within the Relevant Output Market are used.

counts all Fighters who were active within an 18-month window.<sup>211</sup> Dr. Topel claims that my foreclosure calculation “miscounts athletes”<sup>212</sup> because: (1) Zuffa athletes would be counted more than once if they fought more than once during the 18-month window;<sup>213</sup> (2) non-Zuffa athletes who did not fight during the 18-month window would not be counted;<sup>214</sup> and (3) athletes who left Zuffa or were cut by Zuffa during the 18-month window would still be counted provided they fought for Zuffa during the window.<sup>215</sup> Dr. Topel is wrong on all three points.

57. With respect to (1), although it is true that Zuffa athletes would be counted twice if they fought twice within the window, the same is true of non-Zuffa athletes, and thus there is no bias one way or the other. In each case, it is logical and reasonable to count these Fighters each time that they appear in a bout, for the same reason that it makes sense to give an employee who works 40 hours a week twice as much weight as one that works 20 hours per week when calculating the number of full-time equivalent employees at an organization.<sup>216</sup> With respect to (2), although it is true that non-Zuffa athletes who did not fight during the 18-month window would not be counted, the same is true of Zuffa athletes. In each case, the Fighter is symmetrically deemed inactive, with Zuffa and non-Zuffa athletes treated the same, and thus here too there is no bias. The same is true with respect to (3): Fighters who left or were cut from any (Zuffa or non-Zuffa) MMA promoter during the 18-month window would still be counted, provided that the Fighter fought at least once during the window and was included in the Relevant Input Market.

211. *Id.* Part III.C.

212. Topel Report ¶232.

213. *Id.* (“This implies that, for example, a Zuffa athlete may be counted more than once if he or she fought more than once in the 18-month window.”).

214. *Id.* (“a Bellator athlete would not be counted at all if he or she did not fight in the 18-month window”).

215. *Id.* (“Further, an athlete who left Zuffa to fight for Bellator before the month in question, or athletes who retired or were cut by Zuffa before the month in question, will still be included in Zuffa’s share provided they had a bout with Zuffa during the 18-month window.”).

216. See, e.g., <http://www.businessdictionary.com/definition/full-time-equivalent-FTE.html>.

Thus, none of this purported “miscounting” creates any bias (or asymmetric treatment of Zuffa and non-Zuffa Fighters) in my analysis, and Dr. Topel makes no attempt to demonstrate that it does.

58. Dr. Topel also claims that my foreclosure calculation is flawed because it is based on “the overall length of a contract from the date of signing, and does not consider the outstanding amount of time on the contract.”<sup>217</sup> For example, Dr. Topel objects to the fact that a Fighter in the final month of a 36-month exclusive contract is classified as foreclosed.<sup>218</sup> But Dr. Topel gives no reason why such a Fighter should not be considered foreclosed, given that: (1) a Fighter in the final month of his or her contract is still required to fight exclusively for Zuffa; (2) Zuffa could and did use tolling provisions and other provisions to extend the duration of Fighter contracts;<sup>219</sup> and (3) Zuffa could and did exploit the exclusionary terms of its contracts to renew and extend contracts of Fighters who it sought to retain, making exclusion effectively perpetual.<sup>220</sup> Moreover, a Fighter in the so-called “final month” of his or her official contract “term” would still have to wait out the 90-day exclusive negotiation period and the one-year right-to-match period in order to be free from Zuffa exclusivity. In other words, even fighters with “one fight left” would have the time before that last fight (which could be several months) plus an additional 15 months before that Fighter could begin negotiating freely with other MMA promoters.<sup>221</sup> Further, my foreclosure calculations conservatively ignore renewals that Zuffa typically extracted before a Fighter fought his or her last contracted-for bout, typically causing the effective duration of Zuffa’s contractual exclusivity to far exceed 30 months.<sup>222</sup> Additionally, my foreclosure measure conservatively does not count a

217. Topel Report ¶233.

218. *Id.*

219. Singer Report ¶¶68-73.

220. *Id.* ¶¶75-91.

221. *Id.* ¶88-89, Table 1. Dr. Topel admitted that a Fighter with one month left on his or her term would still have 90 days of an exclusive negotiation period and a 12-month right to match period. Topel Dep. at 471:5-12.

222. Singer Report Part III.C.2.

Fighter as being foreclosed one month before the exclusionary contract comes into effect. For example, suppose that a Fighter who fought in January 2012 with another MMA promoter, and then signed an exclusive contract with Zuffa in February 2012. Due to the 18-month window discussed above, that Fighter would be included in the pool of active Fighters for nine months after January 2012, and thus for eight months after February 2012. Moreover, my foreclosure measure would continue to consider the Fighter to be un-foreclosed during that eight-month period into her exclusive contract with Zuffa, unless and until that Fighter happened to fight for Zuffa within the eight-month period. Dr. Topel overlooks this counterbalancing effect.

59. Dr. Topel claims to address these “deficiencies” by calculating foreclosure based on unweighted Fighter counts, stratified by Fighter rank. Given that the point of assessing the degree of foreclosure here is to determine the share of a critical input (namely, Fighters) Zuffa has locked-up in exclusive arrangements, it would not make sense to ignore the relative differences between Fighters and/or the promotions for which they fight. It is for this reason that I use two different weighting methods.<sup>223</sup> Dr. Topel, however, calculates Zuffa’s unweighted share of Fighters ranked 1 through 15, and similarly for Fighters ranked 16 through 30, those ranked 31 through 50, those ranked 51 through 100, and those ranked 101 or worse.<sup>224</sup> Using unweighted Fighter counts is inappropriate because it ignores that Fighters vary in their ability to attract viewers, and hence their value to an MMA promoter.<sup>225</sup> For example, Dr. Topel would calculate the same foreclosure share

223. *Id.* ¶128, ¶¶169-170.

224. Topel Report ¶¶234-235, Exhibits 28-29.

225. Singer Report ¶128.

whether Zuffa had foreclosed the top five Fighters in each weight class, or only the Fighters ranked 11 through 15 in each weight class.<sup>226</sup> Dr. Topel's foreclosure analysis is therefore erroneous.

60. Nevertheless, even Dr. Topel's stratified foreclosure shares indicate that Zuffa has foreclosed a dominant share of Headliners: According to Exhibit 28 of his report, Zuffa foreclosed more than half of Headliners since November 2011, and more than 70 percent of Headliners since September 2013. According to Exhibit 29 of his report, Zuffa foreclosed more than 50 percent of Headliners since May 2011, and more than 70 percent of Headliners since April 2014. Moreover, as explained in Part II.D.3 below, my impact regression confirms that there is a negative and statistically significant relationship between Zuffa's foreclosure share and the Fighter Share for each and every one of Dr. Topel's stratified foreclosure shares. In other words, I show below that even if I were to use Dr. Topel's unweighted foreclosure measure, my regression would *still* demonstrate that as Zuffa's foreclosure share increases, Fighters' share of Event Revenue falls.

61. My initial report explained that the practical effect of the right-to-match period was to block other MMA promoters from signing Zuffa Fighters for the entire twelve-month right-to-match period, that independent analysts recognized that the right to match period had this effect, and that there are virtually no examples of Fighters who Zuffa wished to retain successfully departing Zuffa during the right-to-match period (or, indeed, at any time).<sup>227</sup> Dr. Topel claims that the experience of Fighter Gilbert Melendez is somehow inconsistent with my characterization of

226. In his deposition, Dr. Topel admitted that, on average, "higher ranked fighters, all things equal, generate more revenues when they fight than lower-ranked fighters." Topel Dep. at 432:18-24. He also admitted that audiences are "drawn to fights among highly-ranked opponents." *Id.* at 431:2-7 ("Q. And are audiences drawn to fights among highly-ranked opponents? A. I think – I think ratings are higher. I think there was some evidence that ratings are higher when highly-ranked people fight against each other."). He admitted further that, on average, "consumers will be willing to pay more to see highly-ranked opponents fight than lower-ranked opponents fight." *Id.* at 432:10-17 ("Q. All things equal, consumers will be willing to pay more to see highly-ranked opponents fight than lower-ranked opponents fight; is that fair? .... A. In every instance, no, but on average, probably yes.").

227. My initial report also explained that the right to match clause disadvantaged MMA rivals by forcing them to divulge competitive information in their own Fighter contracts to Zuffa. Singer Report ¶¶84-87.

the right-to-match clause.<sup>228</sup> But, as Dr. Topel concedes, Zuffa successfully retained Melendez by exercising the right-to-match clause.<sup>229</sup> Dr. Topel also claims that the experience of Fighter Andrei Arlovski is also somehow inconsistent with my characterization of the right-to-match clause, because “[u]nder his last Zuffa contract before his 2008 departure from Zuffa, Mr. Arlovski fought five bouts between April 2006 and March 2008, with an average interval of less than 6 months between bouts.”<sup>230</sup> That statistic is misleading, as it obfuscates the fact that nearly eleven months elapsed between Arlovski’s fourth and fifth bouts, prompting complaints that Arlovski was being “shelved.”<sup>231</sup> And although Arlovksi eventually departed the UFC, his departure is the exception that proves the rule: According to Dana White, “there’s only one fighter that I’ve lost that I didn’t want to lose. That was Arlovski, and it still bothers me.”<sup>232</sup> (Arlovski was reportedly “no longer high on the UFC’s shopping list” when he suffered various defeats after departing the UFC; he eventually returned to the UFC in 2014 after rebuilding his career at smaller promotions.)<sup>233</sup> Other than Melendez and Arlovski, Dr. Topel does not offer any other purported counter-examples to my characterization of the right-to-match clause. During his deposition, Dr. Topel admitted that if a Fighter wants to leave Zuffa, she would run a risk by bringing an offer from another MMA promotion to Zuffa during the right-to-match period because Zuffa maintains the automatic right to

228. Topel Report ¶104.

229. *Id.*

230. *Id.* ¶105.

231. See ZFL-2642993 (In January 2008, Khorolinsky (Arlovski’s representative) states in an email to Joe Silva: “As you aware, as of March 1, it will have been almost a year since Andrei’s last fight (as compared to the prior 12 month period in which he fought 4 times). *It is extremely damaging to Andrei’s career to be shelved for such a long period of time.*”). See also Hendrick Fighter Contracts 30(b)(6) at 265:5-267:13; Silva Dep. at 461:7-464:14.

232. See Gary Herman, “UFC is no longer interested in Andrei Arlovski,” *Five Ounces of Pain* (July 30, 2009) [hereafter, “Herman”], available at: <http://www.fiveouncesofpain.com/2009/07/30/ufc-is-no-longer-interested-in-andrei-arlovski/>; Mike Fagan, “The Week in Quotes: December 27th – January 2nd,” Bloody Elbow (Jan. 3, 2009), available at: <https://www.bloodyelbow.com/2009/1/3/708095/the-week-in-quotes-decembe>.

233. See Herman, *supra*. See also Steven Marrocco, “Andrei Arlovski released from WSOF, signs with UFC for targeted bout with Schaub” *MMA Junkie* (April 24, 2014), available at: <http://mmajunkie.com/2014/04/andrei-arlovski-released-from-wsof-signs-with-ufc-for-targeted-bout-with-brendan-schaub>.

match the offer and retain the fighter.<sup>234</sup> Dr. Topel also admitted that: (1) the right-to-match clause could reduce the likelihood that another MMA promotion would make a bid because it would know that Zuffa had the ability to match;<sup>235</sup> (2) without the right-to-match clause, the Fighter would be paid more by Zuffa (that is, that the right to match suppressed Fighter compensation);<sup>236</sup> and (3) he never even considered whether a rival MMA promoter would be less willing to bid due to information sharing in the presence of a right-to-match clause.<sup>237</sup>

62. Dr. Topel further claims that a Fighter should not be considered foreclosed for the full twelve months of the right-to-match period, because a Fighter could (in theory) present Zuffa with a competing offer at any time within the right-to-match period, allowing Zuffa (typically) fifteen days to match the offer.<sup>238</sup> But as explained in my initial report, the right-to-match clause gives Zuffa the right to retain the Fighter simply by matching the terms offered by the other MMA promoter. There is no opportunity for the other bidder to counter with a better offer because the Fighter is contractually obligated to accept Zuffa's matching terms before such a counter offer could be made.<sup>239</sup> The right-to-match clause therefore gives Zuffa the right (if it chooses) to withhold the Fighter from other MMA promoters for the duration of the full twelve months. A Fighter who has elected to leave Zuffa would face a risk in presenting Zuffa a rival offer during the

234. Topel Dep. at 404:19-22. *Id.* at 407:5-8, 409:5-7 (“maybe that’s true that you have to wait that long to avoid this thing that you’re calling risk”).

235. *Id.* at 114:17-24; *see also id.* at 355:8-16 (admitting the right-to-match clause could undermine the incentive of Bellator to formulate a competing bid).

236. *Id.* at 124:1-13.

237. *Id.* at 109:25-110:13.

238. Topel Report ¶198.

239. Singer Report ¶68.

right-to-match period, as it would result in another long-term exclusive Zuffa contract should Zuffa exercise its right to match.<sup>240</sup>

63. Dr. Topel conceded in his report and at his deposition that the right-to-match clause allows Zuffa to exploit its monopsony power by paying Fighters less than their MRP. Dr. Topel offers a hypothetical in which a Fighter's MRP to Zuffa is \$150,000, and is \$100,000 to another promoter such as Bellator. As Dr. Topel observes, the right-to-match clause allows Zuffa to avoid paying Fighters close to their MRP by forcing Fighters to reveal a lower offer from another promoter, and granting Zuffa the right to pay Fighters exactly the amount of the lower Bellator offer, and nothing more.<sup>241</sup> Dr. Blair agrees that in this scenario, the right-to-match clause "ensures that Zuffa gets the entirety of the surplus" instead of splitting it with the Fighter.<sup>242</sup>

240. Topel Dep. at 404:4-22 ("Q. Now, in order to be sure to be able to be free and clear of Zuffa the athlete can't present a contract from a rival promoter because Zuffa could accept it, right? ... If I as an athlete want to leave Zuffa – A. Yes. Q. – and I present Zuffa with a rival bid during the right to match period where Zuffa has the right to match, I risk – A. Has a right to match the material financial stuff? Q. Yes. A. Yes. Q. I risk Zuffa agreeing it, presenting it to me, and then I'm stuck with the Zuffa contract, right? A. Yeah. That's the contract I signed."). See also *id.* at 406:9-407:8 ("Q. All right. You understand that the time period with which Zuffa has the right to match is limited, it doesn't last forever, right? ... Okay. That's the window. If I bring a rival bid to Zuffa at any point during that window – A. Yes. Q. --- and I want to leave Zuffa I risk Zuffa matching and I can't leave, correct? A. If I abide by the terms of the contract as I understand it."); *id.* at 409:5-7 ("Then, you know, maybe that's true that you have to wait that long to avoid this thing that you're calling risk....").

241. Topel Report ¶101. In his deposition, Dr. Topel admitted that eliminating the champion's clause and right to match clause would cause "a transfer of wealth from Zuffa to the athletes" and that "other MMA promoters could immediately retain Zuffa's athletes ... if they wanted to." Topel Dep. at 76:4-24; *id.* at 77:14-20. Dr. Topel also admitted that, if an individual Fighter such as Gilbert Melendez were not subject to the right to match while the rest of the market was, he "would be better off." *Id.* at 108:6-109:6. Dr. Topel also admitted that, after Zuffa Fighter's right to match period has expired, the Fighter would benefit from presenting a rival offer to Zuffa because Zuffa would have to pay more to retain the Fighter. *Id.* at 113:24-114:9. Dr. Topel admitted further that the right to match clause could reduce the likelihood that another MMA promoter would make a competing offer to a Fighter. *Id.* at 114:5-115:9; see also *id.* at 355:12-16, 355:17-356:6. Dr. Topel also testified that it would not surprise him to learn that athletes subject to restricted free agency "tend to get lower bids during the restricted free agency period than after the restricted free agency period." *Id.* at 115:13-116:1.

242. Blair Dep. at 349:8-22 ("Q. But with the right to match clause, Zuffa can sign that fighter for a hundred thousand, and that ensures that Zuffa gets the entirety of the surplus; right? A. In that – in that situation, you know, focusing only on that term, the answer's yes.").)

**2. Dr. Topel Does Not Undermine My Conclusion that the Duration and Staggering of Zuffa's Contracts with Fighters Prevented Meaningful Competition by Other MMA Promoters**

64. My initial report explained that Fighter careers typically last only a few years, which means that even a single Zuffa contract could easily span all or the vast majority of a Fighter's career (even if one ignores Zuffa's ability to leverage the Challenged Conduct to renew and extend Fighter contracts).<sup>243</sup> Dr. Topel claims that this is not the case because the median career length of a UFC Fighter is purportedly approximately 8.9 years.<sup>244</sup> Dr. Topel's statistic is misleading because it encompasses all Fighters who ever had a UFC bout, and encompasses all bouts in which these Fighters ever participated, regardless of promoter, and regardless of the Fighter's rank at the time of each bout in his or her career. As seen in Table 1 below, the median career duration for a Zuffa Fighter *at Zuffa*—typically the apex of a Fighter's career—is 0.82 years; the average is 2.00 years. I also performed similar calculations for Fighters in the Relevant Input Market and Submarket. As seen below, the median duration of Fighter careers ranges from 0.38 years to 1.33 years; the average duration ranges from 1.80 years to 2.55 years. Accordingly, Dr. Topel's 8.9-year statistic is driven by Fighters when they are *outside* the Relevant Input Market and Submarket—in other words, it is capturing the portion of a Fighter's career spent in the minor leagues. (This is analogous to including a professional athlete's time playing in high school and college when calculating the length of her career). Finally, even if Dr. Topel's 8.9-year statistic were relevant, the median contract duration during the Class Period (approximately 35 months or 2.9 years) would still encompass about one third of the median Fighter's career (equal to 2.9/8.9), even before contract extensions and renewals are taken into account.

243. Singer Report ¶¶89-91.

244. Topel Report ¶116.

TABLE 1: FIGHTER CAREER DURATIONS (YEARS)

Fighter Population	Median	Mean
Zuffa Fighters in Zuffa Bouts	0.82	2.00
Relevant Input Market (Tracked Measure)	0.38	1.80
Relevant Input Market (Ranked Measure)	1.33	2.55
Headliner Submarket	1.00	2.26

*Note:* Consistent with Dr. Topel's analysis, Fighters with only one career bout are excluded.

65. Moreover, as my initial report explains, Zuffa's top Fighters were bound by even longer-term contracts than most Fighters and were (like all Fighters) subject to the champion's clause.<sup>245</sup> An analysis performed by WME-IMG dated June 2016 demonstrates that Zuffa's contract durations are longest for champions and top-ranked Fighters:



Further, the champion's clause gave Zuffa the automatic right to retain a champion in any weight class for a substantial period of time.<sup>246</sup> Thus, as Fighters moved up the ranks with Zuffa, their contracts comprised a larger share of the most productive phase of their careers.

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245. Singer Report ¶174.

246. *Id.* ¶69.

66. My initial report explained that Zuffa staggered its Fighter contracts such that, to the extent any would ever expire without renewal or retirement, there would never be a critical mass of Fighters available to a potential rival at any one time.<sup>247</sup> Dr. Topel claims that the staggering of Zuffa's contracts means that "competing promoters have a steady stream of athletes becoming available to them at all times."<sup>248</sup> But in his report and his deposition, Dr. Topel himself concedes that top Fighters and aspiring top Fighters face strong incentives to join the organization that already has the vast majority of top Fighters, which in this case is Zuffa due in large part to the Challenged Conduct.<sup>249</sup> Therefore, putting Fighters on staggered contracts makes it unlikely that another MMA promotion could compete effectively with Zuffa, because no more than a small share of top Fighters (if that) would ever become free agents in any one year.<sup>250</sup> Thus, by Dr. Topel's own logic, the staggering of contracts prevents rivals from acquiring the critical mass of Fighters necessary to compete effectively with Zuffa. My own separate analysis confirms that the dearth of available top-level Fighters indeed impaired other MMA promoters from competing

247. *Id.* Parts II.C.2-3; *see also id.* ¶175.

248. Topel Report ¶118.

249. *Id.* ¶96 ("there is a natural tendency for a leading promoter to attract a significant share of the top athletes. This follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best"). In his deposition, Dr. Topel admitted that there is a natural tendency for a leading promoter to attract a significant share of the top athletes because admits that "athletes – their talents are complimentary, that the good athletes want to be in the places where the – where the other good athletes are so they can fight them." Topel Dep. at 433:14-21. Dr. Topel admitted further that, broadly speaking, Fighters who are successful against higher ranked opponents have greater opportunities for career advancement and increased compensation. *Id.* at 434:16-435:2. Dr. Topel also admitted that Zuffa has "the best fighters on their contracts – many of the best fighters on their contracts." *Id.* at 446:15-19.

250. Dr. Topel admitted that the fact that Zuffa had the vast majority of top fighters under multi-fight exclusive contracts created a barrier to entry for potential entrants to the MMA promotion market. Topel Dep. at 436:20-437:22 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM). Dr. Topel further admitted that "[t]o effectively compete with the UFC a competitor would need proper infrastructure, substantial content to market upcoming fights, effective television distribution, a deep lineup of marquee fighters, and adequate resources to satisfy the costs of a UFC-level production." *Id.* at 440:12-24 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM), and further admitted that "[s]ubstantial capital would also be required for a competing organization to attract the talent necessary to stage a successful event. While good matchmaking from a deep roster of talented fighters under contract is essential." *Id.* at 440:25-441:10 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM).

effectively with Zuffa.<sup>251</sup> Zuffa's current owners and independent analysts have recognized this effect as well.<sup>252</sup>

### **3. Dr. Topel Does Not Undermine My Conclusion That Zuffa's Contracts Were Coercive**

67. My initial report explained that Zuffa's contracts with Fighters were coercive in the sense that Zuffa was able to induce Fighters to submit to exclusionary and anticompetitive terms, by ensuring that Fighters would be made individually worse off by refusing to agree to them.<sup>253</sup> Zuffa exploited its contractual provisions to retain virtually any Fighter it desired, and Fighters agreed to Zuffa's terms because the Challenged Conduct left Fighters no better alternative.<sup>254</sup> In addition, my initial report explains that the Challenged Conduct included terms that asymmetrically restricted Fighters' ability to terminate their contracts; Zuffa's Fighter contracts contain one-way ratchets, giving Zuffa, but not the Fighters, the discretion to continue to enforce exclusivity or to discontinue the contract if Zuffa had no further use for the Fighter.<sup>255</sup> Zuffa's economists make no attempt to demonstrate that these one-way ratchets are somehow procompetitive (they are anything but).

## **II. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY CONCLUSION THAT THE CHALLENGED CONDUCT SUBSTANTIALLY HARMED COMPETITION**

68. My initial report includes regression models demonstrating that, all else equal, a Fighter's compensation expressed as a share of Event Revenues—that is, the Fighter's wage share—is negatively correlated with Zuffa's foreclosure share. In other words, my impact regression model shows that an increase in Zuffa's foreclosure share (and thus its market power)

251. Singer Report Parts III.C.1, III.D.1; *see also* Part I.A.3, *supra*.

252. *Id.* Part III.C.1; *see also* Part I.A.3, *supra*.

253. *Id.* ¶176, Part II.C.1, Part II.B.1.

254. *See* Topel Report ¶96.

255. Singer Report Part II.B.1, ¶176.

leads to a lower wage share for its Fighters.<sup>256</sup> My initial report presents additional evidence of anticompetitive effects, including evidence that the Challenged Conduct restricted the supply of Fighter services in the Relevant Input Market and Submarket, and (relatedly) the supply of Live MMA Events in the Relevant Output Market, in addition to raising prices in the Relevant Output Market.<sup>257</sup> As explained below, Zuffa's economists' critiques of my impact regressions and other evidence of anticompetitive effects are without merit. Indeed, Dr. Topel has conceded the basic economics of how the challenged contracts suppress Fighter compensation.

**A. Dr. Topel Concedes That the Challenged Contractual Provisions Restrict Fighter Mobility, and That Restricted Mobility Reduces Compensation and Facilitates Zuffa's Exercise of Monopsony Power**

69. My initial report reviews each of the challenged contractual provisions in Zuffa's Fighter contracts, and explains how the Challenged Conduct served to initiate, renew, and extend Fighter contracts, making Zuffa's exclusionary provisions effectively perpetual (or nearly so) for the vast majority of Fighters, especially in relation to Fighters' relatively short careers.<sup>258</sup> By restricting Fighter mobility—thereby denying other MMA promoters access to a critical input—the Challenged Conduct permitted Zuffa to suppress Fighter compensation.<sup>259</sup>

70. In his deposition, Dr. Topel admitted that the contractual provisions that Plaintiffs are challenging are “restrictions on athlete mobility.”<sup>260</sup> He also admitted that eliminating the challenged contractual provisions would allow more Fighters to “move [to other promoters]

256. *Id.* ¶¶180-187.

257. *Id.* Parts III.D.2-5.

258. *Id.* Parts II.B-II.C.

259. *Id.* Parts III.C-III.D.

260. Topel Dep. at 75:15-19; *see also id.* at 80:7-16.

because there's more [Fighters] subject to outside bidding,"<sup>261</sup> and that if the challenged provisions were removed, "other MMA promoters could immediately retain Zuffa's athletes ... if they wanted to."<sup>262</sup> He also admitted that "one reason why non-Zuffa firms employ some of the challenged contractual provisions ... is to restrain the mobility of the fighters that work for them."<sup>263</sup>

71. Dr. Topel also admitted that restrictions on Fighter mobility reduce compensation and facilitate the exercise of monopsony power. He agreed that, by making mobility more costly to its workers, a firm can pay them less.<sup>264</sup> He conceded further that that eliminating the challenged contractual provisions would create "a transfer of wealth from Zuffa to the athletes,"<sup>265</sup> and that eliminating the challenged contractual provisions could enhance fighter mobility and lead to higher fighter compensation, at least in the short run.<sup>266</sup> Dr. Topel additionally admitted that, "if there's

261. *Id.* at 78:20-79:1 ("Q. So, in your view, at least in the short run, eliminating the challenged contractual provisions will enhance the mobility of the fighters; is that fair? A. I don't know if you call it enhance the mobility. More of them will move because there's more subject to outside bidding.").

262. *Id.* at 77:14-20.

263. *Id.* at 346:16-347:4.

264. *Id.* at 73:21-74:2 ("Q. So if firm A raises the costs somehow of moving from firm A to firm B, firm A can pay the worker less than if he hadn't raised the cost of mobility, right? ... A. Can pay the worker less than firm B."). Dr. Topel also admitted that there is a "degree" of monopsony power from the mere fact that it is costly for a worker to move from job to job. *Id.* at 344:17-21 ("A. ... There's a degree of monopsony power. You didn't need the wall. I already said there's a degree of what some people would call monopsony power there by the fact that it is – it is costly to move from A to B."). Dr. Topel also admitted that higher mobility costs lead to higher monopsony power. *Id.* at 345:1-8 ("Q. So all things equal, the higher the mobility costs in your example, the higher the monopsony power of the firms, correct? ... A. Yeah. It depends on how we make the mobility costs and things like that. It depends on what we do with the mobility costs."). See also *id.* at 346:1-8 ("Q. So all things equal, the higher the mobility costs in the example the more monopsony power the firms in that example have, all things equal; is that right? ... A. It was important that you said twice 'in that example.' So I agree.").

265. *Id.* at 76:4-77:3. See also *id.* at 84:11-18 ("Q. It's a transfer of wealth, in your view, from Zuffa to the fighters because in this instance Zuffa would either have to pay the fighters more or someone else would pay the fighters more, right? ... A. I think I see where you're going with it and yes.").

266. *Id.* at 84:25-85:5 ("Q. So for the existing stock of Zuffa athletes eliminating the challenged contracts, at least in the short run, would enhance fighter mobility and lead to higher fighter compensation, correct? A. It could do that."). See also *id.* at 86:1-11 ("Q. Is it fair to say in the short run if we eliminate the challenged contractual provisions, one immediate effect is that fighters get paid closer to the amount of Event Revenue that they generate for the promotion; is that fair? ... A. They'll get paid more than they would have because they're getting some of the returns on the investment that were previously shared with – with the investing firm.").

free mobility I can switch to anybody who will pay ‘competitive compensation.’”<sup>267</sup> He also admitted that elimination of the reserve clause permitted baseball player compensation to go up because “property rights were transferred from the team to the players.”<sup>268</sup> In short, Dr. Topel has conceded the basic economics of a key mechanism by which the challenged contracts suppress Fighter compensation: By restricting athlete mobility, Zuffa’s contracts reduce the availability and attractiveness of outside offers, enhance Zuffa’s negotiating leverage and monopsony power, and transfer value from the Fighters to Zuffa. This permits Zuffa to pay Fighters less than they would be paid in a competitive environment absent the challenged contracts.

**B. Dr. Topel Improperly Discards Data from My Impact Regressions Without Any Basis In Standard Econometric Principles**

72. As explained above, according to elementary economic theory, the more monopsony power that a firm enjoys, the more it can suppress compensation below workers’ MRP.<sup>269</sup> Consistent with basic economics, the impact regressions in my initial report analyze Fighter compensation expressed as a share of Event Revenues—that is, Fighter wage share. Given that Fighter MRP cannot be measured directly, my impact regressions use Event Revenue—the amount of revenue generated at a Live MMA Event—as a proxy for the MRP of the Fighters competing in that event. Event Revenue is calculated from various revenue streams specific to a given Live MMA Event, such as Ticket Sales and PPV revenue.<sup>270</sup> Event Revenue is therefore closely related to the MRP of the Fighters participating in a given Live MMA Event.<sup>271</sup>

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267. *Id.* at 92:10-18.

268. *Id.* at 140:19-22. See also Blair Dep. at 37:14-17, 98:22-99:7.

269. See, e.g., Blair Sports Econ at 354.

270. As explained in my initial report, the Event Revenue used in my regression analysis were calculated using Zuffa’s P&L statements, and include Ticket Sales/Site Fees PPV/Broadcast Sales/Fees (including “Web Buys” and “Other”), event-specific Merchandise, and event-specific Sponsorships. Singer Report ¶181, n. 451.

271. Dr. Topel opined in his report and in his deposition that Zuffa’s Fighters are “effective revenue generators.” Topel Dep. at 24:20-25:9 (“Q. Okay. So if what Zuffa does is . . . makes its fighters more effective revenue

73. The impact regressions in my initial report are designed to test the hypothesis that an increase in Zuffa's foreclosure of the Relevant Input Market (or Submarket) allows Zuffa to exercise more monopsony power, by paying Fighters a smaller share of Event Revenue than Fighters would otherwise receive. The regression identifies this effect using two sources of variation, namely: (1) variation in Zuffa's own compensation practices over time (that is, when it had a lower foreclosure share, and thus less monopsony power, historically); and (2) variation between Zuffa's compensation practices and those of Strikeforce before Zuffa acquired it (that is, an entity with much smaller share of the Relevant Input Market).<sup>272</sup>

74. With respect to (1)—variation in Zuffa's own compensation practices over time—if the Challenged Conduct does in fact permit Zuffa to exercise monopsony power, then, all else equal, Zuffa's Fighter compensation will decline as a proportion of Event Revenue as Zuffa's foreclosure share increases over time. In particular, an increase in Fighter MRP will cause both Fighter compensation and Event Revenue to increase. However, Fighter compensation will increase by less than Event Revenue because Zuffa's increased monopsony power gained through growing foreclosure of the Relevant Input Market permits it to keep more of the Event Revenue for itself and pay its own Fighters a smaller share of their MRP, and thus a smaller share of Event Revenue.

generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q. And is it your opinion that Zuffa is particularly good at causing its fighters to be more effective revenue generators? A. I think that's Zuffa's position and I think that's what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes."). Dr. Topel also conceded that both Fighter compensation and Event Revenue are positively related to the willingness to pay to watch MMA fighters. *Id.* at 420:10-29. See also *id.* at 36:24-37:4 ("Q. What you're saying is that one of the ways in which Zuffa has become successful is by boosting the ability of its fighters to generate revenues when they fight, correct? A. Yeah. The point of investing is to generate revenues."); see also Topel Report ¶311. Similarly, Dr. Oyer concedes that "[h]aving good fighters" is one factor that would increase Zuffa's revenue. Oyer Report ¶36. See also Richard McGowan and John Mahon, *Demand for the Ultimate Fighting Championship: An Econometric Analysis of PPV Buy Rates* 6(6) J. BUS. & ECON. 1032-1056 (2015) [hereafter "McGowan & Mahon (2015)"].

272. Singer Report ¶183.

75. With respect to (2)—variation between Zuffa’s compensation practices and those of Strikeforce before Zuffa acquired it—if the Challenged Conduct does in fact permit Zuffa to exercise more monopsony power than other MMA promoters with a smaller share of the Relevant Input Market, then, all else equal, Zuffa will pay its Fighters a smaller share of Event Revenue than the share of Strikeforce’s Event Revenue that Strikeforce paid to its Fighters. To the extent that Fighter MRP at Zuffa is higher than Fighter MRP at Strikeforce,<sup>273</sup> both Fighter compensation and Event Revenue will be higher at Zuffa, relative to Strikeforce. However, the discrepancy in Event Revenue will exceed the discrepancy in Fighter compensation, because Zuffa’s monopsony power permits it to pay its own Fighters a smaller share of their MRP (and thus Event Revenue), relative to Strikeforce.<sup>274</sup> If the Challenged Conduct did not enhance Zuffa’s monopsony power, then neither (1) nor (2) would have yielded any statistically or economically significant effects. But, as my model demonstrates, they did yield statistically and economically significant effects: Zuffa’s increasing foreclosure of the Relevant Input Market leads to a reduced share of Event Revenue paid to Fighters.

76. Therefore, the data set used to estimate my impact regression models includes data for *both* Zuffa Fighters *and* for Strikeforce Fighters prior to Zuffa’s acquisition of Strikeforce.<sup>275</sup> As explained below, Dr. Topel improperly discards the Strikeforce pre-acquisition data from my

273. Dr. Topel admitted in his deposition that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa’s market share in either the input or output markets. *See* Topel Dep. at 370:25-371:13. *See also* Singer Report ¶¶134-140 (explaining that market observers and participants viewed Zuffa as dominant); *id.* ¶¶156-166 (Zuffa foreclosed rivals from access to top-ranked fighters with the highest revenue-generating potential).

274. My initial report also tested the hypothesis that Zuffa’s increasing foreclosure of the Relevant Input Market affected the share of Strikeforce’s Event Revenue that it paid to its fighters to see whether the Strikeforce benchmark I was using could have been biased as a result of the Challenged Conduct. The results of this test indicated that while Zuffa’s foreclosure affected the wage share going to Zuffa Fighters, it did not affect the share of Strikeforce’s Event Revenue going to Strikeforce Fighters. None of Zuffa’s economists challenged this analysis, which provides additional confirmation that Strikeforce is a valid competitive benchmark. *Id.* ¶183, n. 454.

275. *Id.* ¶181.

impact regressions without any basis in standard econometric principles, and in direct contradiction to his own claims.

### **1. Strikeforce Is a Valid Competitive Benchmark**

77. As Zuffa's economists recognize, Strikeforce is a valid competitive benchmark. Indeed, Dr. Topel opines *in his own report* that Strikeforce is a “natural candidate[] for a competitive benchmark.”<sup>276</sup> Dr. Topel agrees as well that Strikeforce and Zuffa operated in the same market, and that Strikeforce lacked market power in that market.<sup>277</sup> Dr. Topel also uses Strikeforce as a competitive benchmark in his own analysis.<sup>278</sup> But when critiquing my impact regressions, which make use of pre-acquisition Strikeforce data, Dr. Topel reverses course, claiming that “Strikeforce is not an appropriate benchmark for Zuffa,”<sup>279</sup> and seeking to discard all Strikeforce data from my analysis.<sup>280</sup>

78. Strikeforce is a valid competitive benchmark and therefore belongs in my impact regression. Strikeforce, like Zuffa, was an MMA promoter; Strikeforce operated in the same industry as Zuffa, in both the Relevant Input Market and the Relevant Output Market. Before Zuffa acquired it, Strikeforce was the “second most prominent and recognized… MMA organization in the world.”<sup>281</sup> Strikeforce produced 47 events across the United States before being acquired.<sup>282</sup>

276. Topel Report ¶287. Dr. Blair recognizes that “Bellator (and Strikeforce before it) competed against Zuffa in the market, and were thus subject to market forces in part affected by Zuffa’s competition.” Blair Report ¶73.

277. Topel Dep. at 303:24-304:7 (“Q. Strikeforce was in the same market as Zuffa, correct? A. Yes. Q. They’re in the same business as Zuffa was? A. Yes. Q. And in your view Strikeforce doesn’t have market power or didn’t test, correct? A. That’s my view.”). See also *id.* at 370:12-15 (“Q. Did Strikeforce have a significant share of the input or output markets at the time it was taken over by Zuffa? A. Evidently not.”). Dr. Topel also testified that to isolate the impact of the Challenged Conduct, an economist needs a “controlled experiment about a *firm in similar circumstances* [that] employed people and paid people or maybe in some identifiably *similar circumstances*.” *Id.* at 59:15-19.

278. Topel Report ¶¶286-288.

279. *Id.* ¶¶151-156.

280. *Id.*

281. ZFL-2463304 at 9.

282. See <http://www.sherdog.com/organizations/Strikeforce-716>

By 2009, “Strikeforce [had]... emerged as the world’s second most prominent promotion, with sufficient size and assets to maintain and improve its position.”<sup>283</sup> Its rise to prominence was cited as the top story of 2009 by Sherdog.com, a popular Internet source of MMA news and information.<sup>284</sup> The key difference between Strikeforce and Zuffa is that Zuffa was dominant and Strikeforce was not.<sup>285</sup>

79. As explained below, Dr. Topel has no basis in standard econometric principles for discarding Strikeforce data from my impact regressions. To the contrary, standard econometric tests implemented in my initial report and discussed further below provide further confirmation that Strikeforce is a valid competitive benchmark.

## **2. The Chow Test Is Not a License to Discard Data**

80. Based on the results of an econometric test known as a Chow test, Dr. Topel concludes that the Strikeforce pre-acquisition bouts should be discarded from the regression.<sup>286</sup> As explained below, Dr. Topel is wrong: The Chow test does not provide any basis for discarding these data. By treating the Chow test as if it were a license to discard inconvenient data, Dr. Topel violates basic econometric principles.

81. The Chow test implemented by Dr. Topel tests the null hypothesis that *all* of the regression coefficients for the Strikeforce pre-acquisition bouts are identical to the regression

283. ZFL-2463304 at 14.

284. *Id.* at 11. *See also* Coker Dep. at 38:6-12 (Strikeforce “got on [the UFC’s] radar and I think they [Zuffa] wanted to control the market share.”). In 2009, after Affliction exited the MMA promotion business and sold its assets to Zuffa, Mr. Coker (Strikeforce’s founder) observed that “Affliction took the easy way out. [N]ow it’s UFC and Strikeforce. If you can’t battle these guys it’s over for the MMA industry. UFC will be the only one left. We’re the last chance. Otherwise, fighters’ purses will go down if UFC is the only one – is the only one period. We’re Luke Skywalker and UFC is Darth Vader and the Death Star.” Coker Dep., Exh. 8; Coker Dep. at 95:10-20.

285. According to Dr. Blair, to evaluate a yardstick (or benchmark) one examines “are these entities comparable in a variety of things? ... are they offering ... the same product? Do they have the same quality management? ... are they engaged in the same sort of promotion? ... to the extent that the goods and services being produced by the yardstick are different ... are they similar enough so that, again ... the purpose of the yardstick analysis is to draw an inference about the plaintiff based on the performance of the yardstick.” Blair Dep. at 335:24-336:9.

286. Topel Report ¶¶155-156.

coefficients for the Zuffa bouts.<sup>287</sup> In other words, it tests whether *all* of 63 coefficients on the independent variables on the regression for the Zuffa bout data *exactly* match all of the 63 coefficients on the independent variables for the Strikeforce data. It is an attempt to see whether *all* of the variables that affect fighter compensation (for example, Fighter rank, win/loss record, etc.) did so in *exactly* the same way for Strikeforce as they did for Zuffa. Rejecting the null hypothesis does not imply that all of the regression coefficients for the Strikeforce pre-acquisition are different from the regression coefficients for the Zuffa bouts. Indeed, the null hypothesis could be rejected if even *one* of the 63 coefficients subjected to Dr. Topel's Chow test were different for the Strikeforce pre-acquisition bouts, compared with the Zuffa bouts. As one econometrics textbook explains, “[o]ne important limitation of the Chow test, regardless of the method used to implement it, is that the null hypothesis allows for no differences at all between the groups.”<sup>288</sup> In other words, the influence of factors affecting the way Strikeforce paid its fighters could be nearly identical to those affecting the way Zuffa paid its fighters, and the Chow test would nonetheless “reject the null hypothesis,” resulting in a “finding” that the two datasets behave differently when, in fact, they are substantially the same. That is the case here.

82. Because of this limitation, Dr. Topel's use of the Chow test provides no basis in standard econometrics for discarding the Strikeforce pre-acquisition bouts from the regression. In discarding the Strikeforce pre-acquisition data, Dr. Topel disproportionately discards observations in which the wage share is relatively high, given that Strikeforce Fighters were paid a higher share of Event Revenue compared with Zuffa Fighters (which makes sense given that Strikeforce had

287. JEFFREY WOOLDRIDGE, INTRODUCTORY ECONOMETRICS: A MODERN APPROACH 243 (Thompson 4th ed. 2009) (explaining that the “null hypothesis [of the Chow test is] that two populations or groups follow the same regression function, against the alternative that one or more of the slopes differ across the groups”) [hereafter “Wooldridge”].

288. *Id.* at 245.

less market power than Zuffa did). This means that Dr. Topel engages in “endogenous sample selection,” which leads to biased coefficient estimates according to well-established econometric principles.<sup>289</sup> Dr. Topel does not and cannot cite to a single econometric authority that would justify discarding the Strikeforce pre-acquisition bouts based on a Chow test that allows for no differences whatsoever between the Strikeforce pre-acquisition coefficients and the Zuffa coefficients. For example, the ABA publication cited by Dr. Topel does *not* state that data should be discarded; it merely says that, if the null hypothesis of the Chow test is rejected, “the appropriate model needs to adequately control for such [differences].”<sup>290</sup> During his deposition, Dr. Topel admitted that the Chow test is a test of whether “all of the 63 regression coefficients between the Strikeforce pre-acquisition bouts were identical to the coefficients on the Zuffa bouts”<sup>291</sup>; that an economist would not throw out data as a result of a Chow test in “every context in which you’d estimate a model;”<sup>292</sup> that he could not offer a single citation for throwing out data in response to a Chow test;<sup>293</sup> and conceded that the Chow test cannot “tell you whether to include some observations . . . in a regression but not others.”<sup>294</sup>

83. As explained below, my initial report already did control for differences between the Strikeforce and Zuffa bout data using standard econometric methods—methods that Dr. Topel did not challenge or critique. These methods allowed the effect of Zuffa’s foreclosure to vary between Zuffa bouts and Strikeforce pre-acquisition bouts, and provided confirmation that the

289. *Id.* at 323 (explaining that “[m]issing data is more problematic when it results in a nonrandom sample from the population,” and that “sample selection based on the dependent variable...is an example of endogenous sample selection. If the sample is based on whether the dependent variable is above or below a given value, bias always occurs in...estimating the population model”).

290. Topel Report ¶155 n. 221, citing ABA SECTION OF ANTITRUST LAW, PROVING ANTITRUST DAMAGES 179 (2nd ed. 2010) [hereafter, “ABA Antitrust Damages”].

291. Topel Dep. at 254:13-22.

292. *Id.* at 259:6-13.

293. *Id.* at 261:6-262:9.

294. *Id.* at 301:7-10.

Strikeforce pre-acquisition bouts are a valid competitive benchmark. Moreover, my impact regressions also continue to show classwide impact and damages even after controlling for other potential differences between the Zuffa bout data and the Strikeforce pre-acquisition bout data, such that if there were indeed differences between these two data sources, the model would account and control for such differences.

**3. Correct Application of the Chow Test Shows Classwide Impact and Damages, As Demonstrated in My Initial Report and Confirmed by Additional Analyses**

84. Rather than discarding the Strikeforce pre-acquisition bouts, the standard econometric approach is to retain Strikeforce pre-acquisition bouts in the regression, and to allow *subsets* of the coefficients to vary to the extent justified by additional statistical tests.<sup>295</sup> Indeed, Dr. Topel admitted at his deposition that even if (hypothetically) 2013 Zuffa bout data were different from the rest of the Zuffa bout data sample per a Chow test, it would be better to include those data and use an interaction term instead of discarding that data.<sup>296</sup> That is precisely the approach I adopted in my initial report for the pre-acquisition Strikeforce data. I allowed the coefficient on Zuffa's foreclosure share to differ across Zuffa bouts and Strikeforce pre-acquisition bouts, based on the results of a Chow test. This test confirms that Zuffa's foreclosure did not significantly affect the wage shares of pre-acquisition Strikeforce Fighters, and therefore the pre-acquisition Strikeforce Fighters provide a good proxy for the wage share that would be observed in the but-for world absent Zuffa's challenged contracts.<sup>297</sup>

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295. Wooldridge at 243-246.

296. Topel Dep. at 311:4-13.

297. Singer Report ¶¶182-183; *id.* n.454. My initial report used a standard *F*-test to confirm "that Zuffa's foreclosure affected the Fighter Shares of Zuffa Fighters, but not Strikeforce pre-acquisition Fighters." *Id.* n.454. This *F*-test is simply a variant of the Chow test of the hypothesis that the slope coefficient on Zuffa's foreclosure share is identical for Zuffa bouts and Strikeforce pre-acquisition bouts. Note that a Chow test is simply a particular type of *F*-test. Wooldridge at 245.

85. The statistical test in my initial report focused on the coefficient on Zuffa's foreclosure share (the key variable of interest here). In response to Dr. Topel's critique, I have now run additional Chow tests to confirm that the results of my regression model are preserved when other coefficients are permitted to vary between the Zuffa bout data and the Strikeforce bout data. I conducted additional Chow tests which indicated that, of the 63 coefficients subjected to the Chow test as used by Dr. Topel, 19 were statistically identical for Strikeforce pre-acquisition bouts and Zuffa bouts. When I re-estimate the regression model allowing for the remaining 44 coefficients to vary between Zuffa bouts and Strikeforce pre-acquisition bouts, my impact regressions continue to show a negative and statistically significant relationship between Zuffa's foreclosure share and the Fighter Share for all three measures of the Relevant Input Market and Submarket.<sup>298</sup> In each case, the estimated coefficient on Zuffa's foreclosure share is negative and significant, both statistically and economically.<sup>299</sup> Indeed, in the case of the Tracked measure of the Relevant Input Market, the estimated coefficient on Zuffa's foreclosure share is *larger* than the effect estimated in my initial report.<sup>300</sup> As these results confirm, Strikeforce pre-acquisition bouts are one of the best available benchmarks for the share of revenue that Fighters would receive in a competitive market and are appropriately included in the impact regressions.<sup>301</sup>

#### **4. Dr. Topel Makes False Claims Regarding the Strikeforce Pre-Acquisition Bouts**

86. Solely for purposes of testing whether my model would obtain similar results even without the Strikeforce data—that is, whether the regression continues to find a statistically

298. See Appendix Table A1.

299. *Id.*

300. *Id.*

301. This conclusion is supported by additional evidence reviewed in my initial report. See Singer Report ¶¶182-183, ¶190. See also Part II.B.1, *supra* (explaining that Strikeforce is a valid competitive benchmark, as Dr. Topel himself has admitted).

significant relationship between foreclosure share and wage share—my initial report estimated an alternative version of the regression model that dropped the Strikeforce pre-acquisition bout data.<sup>302</sup> Dr. Topel claims falsely that this somehow constitutes an admission that including the Strikeforce pre-acquisition bouts in my regression is not econometrically justified.<sup>303</sup> I admitted no such thing. Dr. Topel also claims falsely that the version of my regression model that excludes the Strikeforce bout data “predicts zero damages,”<sup>304</sup> and presents results suggesting that the coefficient on foreclosure share is negative and statistically significant in only one out of my three measures of the Relevant Input Market and Submarket.<sup>305</sup> That is incorrect. The foreclosure share coefficient is negative and economically significant for all three measures of the Relevant Input Market and Submarket, and is negative and statistically significant at conventional levels for both the Tracked and Ranked measures.<sup>306</sup> Moreover, when foreclosure is measured simply as the share of Fighters under contract with Zuffa (as opposed to only those with contractual exclusivity above the 30-month threshold), the foreclosure share coefficient is negative, economically significant, and highly statistically significant for all three measures of the Relevant Input Market and Submarket.

87. Dr. Topel also claims incorrectly that the fact that excluding the Strikeforce pre-acquisition bouts lowers the damages from \$1.6 billion to \$894 million shows that my impact

302. Singer Report ¶249.

303. Topel Report ¶157.

304. *Id.* ¶¶157-160.

305. *Id.* ¶158; *id.* Exhibit 15, columns (1) – (3).

306. *Id.* ¶158 Exhibit 15, columns (1) – (3). Dr. Topel claims that “the coefficient on Dr. Singer’s Tracked input market is -0.0246 and it is not statistically significant by conventional standards.” *Id.* ¶159. In fact, the coefficient is statistically significant at the ten percent level, which is consistent with standard practice. *See, e.g.*, Wooldridge at 123-124, 133, 139. This is confirmed by references cited by Dr. Topel. *See* ABA Antitrust Damages at 143 (“The 5 percent level of significance...is often used by economists and statisticians when conducting hypothesis tests, but other levels of significance, such as 1 percent or 10 percent, are also sometimes used.”). *See also* FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 320 (National Academies Press 3rd ed. 2011) (“10% tests can also provide useful information.”). I understand the ten percent significance level to be well within the “preponderance” standard applicable to plaintiffs’ proof in this civil case.

regression model is “unreliable.”<sup>307</sup> That is incorrect, and the ABA publication cited by Dr. Topel does not support his claim. The ABA publication states (correctly) that “econometric results typically should not change materially with minor changes to the data (*e.g.*, deleting a few observations).”<sup>308</sup> Discarding the Strikeforce pre-acquisition bouts involves a lot more than merely deleting “a few observations;” these data comprise a total of 212 data points. Discarding the Strikeforce pre-acquisition bouts also is not a “minor change” to the data—as in, a *random* removal of a very small percentage of observations. As explained in my initial report, the Strikeforce pre-acquisition bouts represent one of two important sources of variation in the data that the regression relies upon to identify the effect of Zuffa’s foreclosure on the Fighter Share.<sup>309</sup> Discarding these data in a non-random way is an example of “endogenous sample selection,” which leads to biased coefficient estimates according to basic econometric principles.<sup>310</sup> In other words, excluding data systematically (as opposed to randomly), based on the value of the dependent variable (here the share of compensation going to fighters), as Dr. Topel proposes to do, yields biased and inconsistent results. It is not at all surprising or problematic for my methods that the effect of non-randomly removing this key source of variation is significant.

307. Topel Report ¶157.

308. ABA Antitrust Damages at 130.

309. Singer Report ¶183 (“The coefficient  $\beta_1$  therefore captures two effects: (1) the effect of Zuffa’s increasing foreclosure share over time on Zuffa Fighter Shares, relative to those of Zuffa Fighters in time periods with lower foreclosure shares, after controlling for all other variables in the regression; and (2) the effect of Strikeforce Fighter Shares prior to the acquisition exceeding Zuffa Fighter Shares (after controlling for all other variables in the regression). Therefore, both the Strikeforce pre-acquisition Fighter Shares and Zuffa Fighter Shares during periods of (relatively) low foreclosure effectively serve as benchmarks for the Fighter Shares that Zuffa Fighters would have received in the but-for world.”).

310. Because Strikeforce paid a higher share of its Event Revenue to its Fighters than Zuffa did to Zuffa fighters, discarding the Strikeforce pre-acquisition bouts is an example of sample selection based on the value of the dependent variable (in this case, the Fighter Share). See Wooldridge at 323 (Explaining that “[m]issing data is more problematic when it results in a nonrandom sample from the population,” and that “sample selection based on the dependent variable...is an example of endogenous sample selection. If the sample is based on whether the dependent variable is above or below a given value, bias always occurs in...estimating the population model”).

**C. Zuffa's Expert Economists Falsely Claim That Wage Shares Play No Role in Standard Economic Analyses of Market Power**

88. Drs. Topel, Oyer, and Blair claim that the share of event revenue paid to labor—the dependent variable in my regressions—is an inappropriate focus of analysis for an economist. Dr. Topel claims that “standard economic models of competitive labor markets make predictions about the *level* of worker pay, not about worker pay as a *share* of revenue.”<sup>311</sup> Similarly, Dr. Oyer claims that “labor share is not an economically accepted way to evaluate worker compensation,”<sup>312</sup> and that “[l]abor share is not generally accepted in the field of labor economics as a method for determining compensation in a competitive labor market[.]”<sup>313</sup> Although Dr. Blair does not address my analysis specifically, he claims that Professor Zimbalist’s analysis of the “labor share of total revenue going to athletes... and the labor share going to the athletes in UFC... is inconsistent with standard principles of economics.”<sup>314</sup> Drs. Topel and Oyer claim that the absolute level of worker pay is the one and only metric suitable for the analysis of monopsony power.<sup>315</sup> None of Zuffa’s expert economists offers a citation to any authority, legal or economic, supporting these categorical and erroneous claims regarding use of labor (or wage) share as a mode of analysis.<sup>316</sup>

89. As explained below, Zuffa’s economists’ claims are demonstrably false as a matter of both economic theory and applied economics. Standard economic models do, in fact, make predictions regarding and using wage shares. In labor markets for professional athletes, and in other industries where incremental revenue is directly traceable to a worker’s efforts, wage shares

311. Topel Report Part VI.B. (emphasis added).

312. Oyer Report Part V.A.

313. *Id.* ¶30.

314. Blair Report ¶12.

315. Oyer Report ¶¶17-19; Topel Report ¶¶129-132.

316. Indeed, the Oyer Report provides no citations in ¶¶28-31, other than to my deposition transcript.

are used by economists to analyze market power of firms relative to workers. Dr. Oyer offers a useful analogy to salespeople, opining that for such workers “we have very good measures that do a good job of approximating their marginal product of labor.”<sup>317</sup> This traceable connection between certain workers’ MRP and incremental revenue is precisely why Uber drivers are paid a percentage of their fares, and why, as Dr. Oyer observes, salespeople are paid a commission equal to percentage of their sales generation (a wage share).<sup>318</sup>

90. As explained below, in sports economics, a standard approach spanning decades has been to measure athlete compensation relative to some measure of the revenue generated by athletes.<sup>319</sup> As Zuffa’s own economists concede, according to elementary economic principles, when an employer exercises monopsony power, workers are underpaid relative to the *marginal revenue* that they generate—that is, their MRP.<sup>320</sup> Consistent with this logic, Dr. Topel’s own consulting work has implemented a detailed analysis of labor shares in professional football.<sup>321</sup> More generally, economists have analyzed wage shares in various industries, in everything from basic economics textbooks to cutting-edge academic articles—including in economic literature cited by Dr. Oyer.<sup>322</sup> Dr. Oyer’s own published work recognizes the significance of share-based

317. Oyer Dep. at 81:25-82:4.

318. See Oyer Report ¶16. As another example, in *Johnson v. AzHHA*, the court’s class certification opinion recognized the significance of temporary nurses’ incremental revenue in determining nurse compensation, noting that “Dr. Singer cites deposition testimony...that nurses were paid somewhere between 70 and 76 percent of the revenues the agency took in from a hospital paying AzHHA Registry-determined [bill] rates.” Because temporary nurses’ compensation was a percentage of their billings, the Court also recognized that “it stands to reason that...if bill rates were to rise, so would temporary nursing wages.” See *Johnson v. Arizona Hospital & Healthcare Ass’n*, No. CV 07-1292-PHX-SRB (D. Ariz. 2009), at 12-13.

319. See Part II.C.1, *infra* (pages 72-80).

320. Oyer Report ¶18. Dr. Topel admits that standard monopsony models relate a worker’s pay with “the value of a worker’s marginal product.” Topel Report ¶130.

321. See Kevin Murphy & Robert Topel, “The Economics of NFL Team Ownership,” Chicago Partners (2009) [hereafter, “Murphy and Topel”], at 2, 15-16; see also Topel Dep. at 230:12-231:7.

322. See Part II.C.2, *infra* (pages 80-86).

analysis in labor economics, including in the context of evaluating monopsony power.<sup>323</sup> It is therefore curious that Dr. Oyer and Dr. Topel, in the context of this case, would categorically disavow the use of labor shares to evaluate the exercise of monopsony power.

91. When presented with several articles from the sports economics literature analyzing athletes' share of revenue to assess monopsony power, Dr. Oyer admitted in his deposition that numerous studies did in fact use wage share, not wage levels, and that he was unfamiliar with this body of empirical labor economics.<sup>324</sup> Even Dr. Topel himself has used wage shares in his capacity as a consultant to the NFL Players' Association to study the impact of the 2006 Collective Bargaining Agreement on revenue allocation between players and owners.<sup>325</sup> When confronted with his own work, Dr. Topel revised his opinion that wage shares are never used. He adopted instead the equally untenable and incoherent position that wage shares are used to study only the impact of *ending* monopsony power but not used to study the *existence* or exercise of monopsony power.<sup>326</sup>

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323. *Id.*

324. See, e.g., Oyer Dep. at 104:12-18 ("Q. Okay. And without reviewing the paper any further, are you aware that Professor Scully analyzed compensation as a share of revenue for Major League Baseball, the National Basketball Association, the National Football League, and the National Hockey League to assess monopsony power? A. I was not aware of that."). See also Oyer Dep at 105:3-110:4 (discussing Lawrence Kahn, *The Sports Business as a Labor Market Laboratory*, 14(3) JOURNAL OF ECONOMIC PERSPECTIVES 75-94 (2000) [hereafter "Kahn (2000)"]); Oyer Dep. at 110:5-113:6 (discussing John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) REVIEW OF INDUSTRIAL ORGANIZATION 5-44, 42 (2009)); Oyer Dep at 114:23-117:6 (discussing Monks (2013)); Oyer Dep at 117:9-119:4 (discussing ROBERT PINDYCK & DANIEL RUBINFELD, MICROECONOMICS 549 (Pearson 8th ed. 2013)). Dr. Oyer admitted that this is a "well respected" and standard economics textbook. Oyer Dep at 13:24-14:4; 14:10-11.

325. Murphy and Topel, at 2 ("The percentage of total revenues paid to players in the years following the 2006 CBA extension is lower than the average percentage paid to players since the NFL and the players entered into the current salary cap/free agency system in 1993. Recent increases merely reverse evidence of a downward trend that began in 1999."). See also Topel Dep. at 230:12-231:7.

326. Topel Dep. at 217:4-18.

**1. Sports Economists Commonly Analyze Market Power Using the Share of Revenue Paid to Athletes**

92. According to basic economic principles, labor in a competitive market receives compensation equal to its MRP, defined as the dollar value of what a worker produces.<sup>327</sup> When the labor market is not competitive, employers exploit their monopsony power to pay workers less than their MRP.<sup>328</sup> As Dr. Oyer correctly observes, “in a ‘monopsonistic’ labor market where a firm has market power over its workers, the firm will pay its workers less than their marginal [revenue] product of labor.”<sup>329</sup>

93. MRP plays the same role for the monopsonist in wage setting as marginal cost plays in price setting by a monopolist. In the case of monopoly, the exercise of market power drives the price charged to customers *above* marginal cost;<sup>330</sup> in the case of monopsony, the exercise of market power drives the wage paid to labor *below* the MRP.<sup>331</sup> Therefore, monopsony power can be and is measured by economists as the ratio of (1) the amount that workers are actually paid to (2) the incremental revenue that workers generate—that is, their MRP. Economists have frequently performed such analyses in the market for professional athletes, given the relatively clear connection between athlete performance and incremental employer revenue. Professional sports provides “an ideal ‘laboratory’ to study worker compensation”<sup>332</sup> because it offers detailed information relating to both compensation and MRP for individual athletes.

327. KATZ & ROSEN at 312-315; *see also* Fort Sports Econ at 206 (“In a competitive talent market, we expect that players get paid pretty close to their MRP.”).

328. *See, e.g.*, Blair Sports Econ at 354 (explaining that, when professional athletes are paid less than their MRP, “[t]his is *exploitation* in the sense that the player is paid less than his value to the club”) (emphasis in original).

329. Oyer Report ¶18. In his deposition, Dr. Oyer clarified that he equates “marginal product” with “marginal revenue product.” Oyer Dep. 16:6-18.

330. KATZ & ROSEN at 417-419.

331. Blair Sports Econ at 354.

332. David Berri, Michael Leeds, & Peter von Allmen, *Salary Determination in the Presence of Fixed Revenues* 10 INTERNATIONAL JOURNAL OF SPORT FINANCE 5-25 (2015), at 6. *See also* Kahn (2000).

94. The sports economist Gerald Scully “produced the first—truly pioneering—work on this difficult subject,”<sup>333</sup> which “provided valuable insights into the dramatic disparity between pay and performance in [Major League Baseball] before the advent of free agency.”<sup>334</sup> Specifically, in a 1974 paper published in the prestigious *American Economic Review*,<sup>335</sup> Professor Scully<sup>336</sup> did not simply examine the absolute *level* of compensation paid to athletes. Professor Scully recognized that compensation levels can be highly misleading: Professional sports have seen substantial growth in revenues over time. A singular focus on compensation levels would likely reveal substantially rising athlete salaries. But looking at compensation levels alone—as Zuffa’s economists propose to do here—would miss the real story where athlete compensation is growing *at a far slower rate than the revenues athletes are generating for their respective teams or firms, that is, their MRP.*<sup>337</sup> Thus, Professor Scully analyzed player compensation as a *percentage* of the revenues that athletes generate for their teams. If one ignores the revenues that athletes generate for teams, it is difficult or impossible to determine whether athletes are being paid a competitive wage or the degree to which compensation reflects monopsony power. Professor Scully found that athlete salaries came to only about 15 to 20 percent of athlete MRP, and concluded that, before free agency (in the late 1960s), “monopsonistic exploitation was

333. Blair Sports Econ at 354-55.

334. *Id.*

335. Gerald Scully, *Pay and Performance in Major League Baseball*, 64 AMERICAN ECONOMIC REVIEW, 915-930 (1974) [hereafter “Scully (1974)”].

336. Professor Scully’s obituary states that he authored “Landmark Baseball Analyses.” See Bruce Weber, *Gerald W. Scully, Who Wrote Landmark Baseball Analysis, Dies at 67*, NEW YORK TIMES, June 6, 2009, available at <http://www.nytimes.com/2009/06/07/sports/baseball/07scully.html>.

337. Scully (1974) at 915 (explaining that “[baseball] owners insist that player salary demands are unrealistically high...Somehow, a \$150,000 a year ball player claiming exploitation is anti-heroic”). A 2013 article published in the *Journal of Sports Economics* explains that analyzing compensation in levels requires data on comparable and truly competitive compensation that serves as a benchmark. If the benchmark is contaminated, in the sense that it reflects the exercise of monopsony power, then the levels-based approach will yield systematically biased results. See John Charles Bradbury, *What is Right with Scully Estimates of a Player’s Marginal Revenue Product*, 14(1) JOURNAL OF SPORTS ECONOMICS 87-96 (2013) [hereafter, “Bradbury”] at 93.

significant”<sup>338</sup> in the labor market for professional baseball players. In subsequent work, Professor Scully found that players earned a somewhat higher fraction of their MRP as of the late 1980s, indicating that monopsony power in baseball was still present, but not as pronounced, at that time.<sup>339</sup> Professor Scully’s trailblazing approach has been applied in many peer-reviewed papers.<sup>340</sup>

95. Economists also recognize that directly measuring athlete MRP is “fraught with difficulties and complexities under the best of circumstances.”<sup>341</sup> As an alternative or proxy for MRP, “[e]conomists have often used the share of revenue returned to the players in the form of salaries as evidence of the degree of monopsony control.”<sup>342</sup> For example, in a 2004 article published in *Managerial and Decision Economics* titled “Player Salary Share and the Distribution of Player Earnings,” Professor Scully explained that:

While all professional team sports had monopsonistic labor markets in the past, all have veteran free agency now. This change from a restricted to a free labor market (at least for

338. Blair Sports Econ at 355.

339. Kahn (2000) at 82-83.

340. *Id.* at 82. See also Bradbury, *supra*; see also GERALD SCULLY, THE BUSINESS OF MAJOR LEAGUE BASEBALL (University of Chicago Press 1989), Chapter 8; Roger G. Noll, *Attendance and Price Setting*, in ROGER G. NOLL, GOVERNMENT AND THE SPORTS BUSINESS, 115-157 (Brookings Institution, 1974); Ira Horowitz, *Sports Broadcasting*, in ROGER G. NOLL, GOVERNMENT AND THE SPORTS BUSINESS, 275-323 (Brookings Institution, 1974); Gerald W. Scully, *Binding Salary Arbitration in Major League Baseball*, 21(3) AMERICAN BEHAVIORAL SCIENTIST 431-450 (1978); James Cassing and Richard W. Douglas, *Implications of the Auction Mechanism in Baseball's Free Agent Draft*, 47(1) SOUTHERN ECONOMIC JOURNAL 110-121 (1980); Paul M. Sommers and Noel Quinton, *Pay and Performance in Major League Baseball: The Case of the First Family of Free Agents*, 17(3) THE JOURNAL OF HUMAN RESOURCES 426-436 (1982); Henry J. Raimondo, *Free Agent's Impact on the Labor Market for Baseball Players*, 4(2) JOURNAL OF LABOR RESEARCH 183-93 (1983); James R. Hill and William Spellman, *Professional Baseball: The Reserve Clause and Salary Structure*, 22(1) INDUSTRIAL RELATIONS 1-19 (1983); Rodney D. Fort and Roger G. Noll, *Pay and Performance in Baseball: Modeling Regulars, Reserves and Expansion*, California Institute of Technology Social Science Working Paper 527 (May 1984), available at <https://authors.library.caltech.edu/81597/1/sswp527.pdf>; Roger G. Noll, *The Economics of Sports Leagues* in GARY A. UBERSTINE, LAW OF PROFESSIONAL AND AMATEUR SPORTS (Clark Boardman 1988).

341. Monks (2013) at 3. See also Anthony Krautmann, *What's wrong with Scully-Estimates of a Player's Marginal Revenue Product* 37(2) ECONOMIC INQUIRY 369-381 (1999).

342. Monks (2013) at 3. Dr. Blair conceded that measuring the marginal revenue product of athletes is difficult in practice. Blair Dep. at 305:7-11 (Supposing there are only two inputs to an MMA events, athletes and venues, “revenue [is] zero if either one of those things is zero. So, having put on the event ... allocating ... a portion of the revenue to each of them would be ... pretty difficult.”).

eligible veteran players) creates a natural experiment in which the effects of freedom of the market can be examined and measured.<sup>343</sup>

In performing this analysis, Professor Scully calculated compensation as a share of revenue for Major League Baseball (“MLB”), the National Basketball Association (“NBA”), the National Football League (“NFL”), and the National Hockey League (NHL). He found that, for each sport, compensation increased substantially *as a share of revenue* after free agency was introduced. Specifically, Professor Scully found that MLB player salaries increased from 15.9 percent of revenue in the 1970-73 period to 48.4 percent in 1998. In the NBA, the increase was from 46.1 percent to 54.2 percent. In the NFL, players’ share of revenue increased from 34.4 percent to 55.4 percent. In the NHL, the increase was from 21.3 percent to 58.4 percent.<sup>344</sup>

96. Professor Scully also explained that, although free agency for veteran athletes had already resulted in approximately 50 percent of revenue being paid to professional athletes, additional liberalization of labor-market restrictions on non-veteran players could increase the share of revenue paid to athletes still further:

If one takes the American economy as a whole, labor compensation is about 75% of national output. One would expect that under unrestricted free agency for all players the upper bound on player compensation as a share of revenue in team sport would approach about 70%.<sup>345</sup>

Accordingly, labor’s share of revenue (or output) is a highly relevant measure of competition in labor markets.

97. Other sports economists have reached similar conclusions based on similar analyses. An article published in 2000 in the prestigious *Journal of Economic Perspectives* notes that “baseball salaries as a percentage of team revenues rose from 17.6 percent in 1974 to 20.5

343. Gerald Scully, *Player Salary Share and the Distribution of Player Earnings*, 25(2) MANAGERIAL AND DECISION ECONOMICS, 77-86, 77 (2004).

344. *Id.*, Table 1.

345. *Id.* at 80.

percent in 1977 to 41.1 percent in 1982, further suggesting that free agency has had a structural effect on baseball salary determination.”<sup>346</sup> The author goes on to explain that the share of revenue paid to baseball players temporarily declined when owners attempted to reassert monopsony power in the 1980s:

[I]n a series of grievance arbitration decisions in the 1980s, the [baseball] owners were found guilty of colluding by not making offers to free agents...[S]alaries as a percent of revenues fell from about 40 percent in 1985 to 32 percent in 1989 during the collusion period. In 1989, arbitrators levied a \$280 million back pay penalty on the owners to be paid out over the 1989-91 period as compensation for the losses imposed by collusion, and salaries as a percent of revenue bounced back to 43 percent by 1991. The collusion episode provides a further illustration of the potential impact of monopsony on salaries.<sup>347</sup>

In a 2009 article published in the *Review of Industrial Organization*, Professor John Vrooman concludes that:

As the result of internal competition among sportsman owners, monopsonistic exploitation has virtually vanished over the last decade in all [major professional sports] leagues. All leagues have similar carrying capacities for player costs at *two-thirds of revenues* and current payroll cap percentages are almost identical at about 60 percent.<sup>348</sup>

This finding, which directly connects (reduced) monopsony power with (increased) wage shares, is both absent from, and directly contradicts, Zuffa’s economists’ sweeping claims that “it’s never been done that way.” Indeed, none of Zuffa’s economists even cites any of the wage share literature I discuss and evaluate from the sports economics field or otherwise.

98. In a 2012 publication, Professor Vrooman analyzes players’ share of revenue in the NFL, specifically in light of the “NFL owners’ considerable monopsony power.”<sup>349</sup> In an article published in 2011, Professors Twomey and Monks analyze revenue shares as a means to infer the

346. Kahn at 75-94, 81 (citing ANDREW ZIMBALIST, BASEBALL AND BILLIONS (New York: Basic Books 1992)).

347. *Id.*

348. John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) REVIEW OF INDUSTRIAL ORGANIZATION 5-44, 42 (2009) (emphasis added).

349. John Vrooman, *The Economic Structure of the NFL* in THE ECONOMICS OF THE NATIONAL FOOTBALL LEAGUE: THE STATE OF THE ART, 7 SPORTS ECONOMICS, MANAGEMENT AND POLICY 22-25, 29 (K.G. QUINN ED., Springer 2012).

exercise of monopsony power by major league soccer (“MLS”) in the United States.<sup>350</sup> The authors find that the MLS has a “monopsonistic structure that was designed to eliminate competition for players across teams within the league,”<sup>351</sup> and that the MLS devotes “only about 25 percent of its revenues to player salaries, compared to 50 to 60 percent in most other U.S. professional sports and professional soccer leagues”<sup>352</sup> They conclude that, *in light of the disparity in wage shares between MLS and these other professional sports*, the MLS has been effective in exercising monopsony power over its athletes.<sup>353</sup>

99. In a 2013 study, Professor Monks explains that the National Collegiate Athletic Association “operates as a collusive monopsony in the labor market for athletic (player) talent,”<sup>354</sup> and analyzes “the degree to which the NCAA’s cap on player remuneration...restricts the *share of revenue* returned directly to the players, in comparison to professional athletic leagues in the United States.”<sup>355</sup> Professor Monks concludes:

The major professional sports leagues in the United States (baseball, basketball, football, and hockey) all have negotiated aggregate salaries that represent over fifty percent of league-wide revenues. In comparison...intercollegiate athletes receive payments-in-kind, via athletic scholarships, that constitute less than 22 percent of total athletic department revenues. Clearly the monopolistic practices of the NCAA are effective in restricting the compensation of athletes.<sup>356</sup>

350. John Twomey & James Monks, *Monopsony and Salary Suppression: The Case of Major League Soccer in the United States*, 56(1) THE AMERICAN ECONOMIST 20-28 (2011).

351. *Id.* at 20.

352. *Id.*

353. *Id.*

354. Monks (2013) at 2.

355. *Id.* (emphasis added); *see also id.* at 3 (“A common method of estimating the degree of monopsony control of an industry or employer is to compare the marginal revenue product of an athlete to his or her compensation. This exercise is fraught with difficulties and complexities under the best of circumstances, and clearly is untenable when considering millions of athletes across numerous sports. An alternative mechanism for establishing the degree of monopsony control *in a sporting industry* is to examine the share of revenue returned to the players. *Economists have often used the share of revenue returned to the players in the form of salaries as evidence of the degree of monopsony control.*”) (Emphasis added).

356. *Id.* at Abstract (emphasis added).

100. Elementary economics textbooks also discuss the relationship between the degree of monopsony power wielded by professional sports leagues, on the one hand, and the *share of revenue* paid to professional athletes, on the other. One standard microeconomics textbook by Professor Robert Pindyck of MIT and Professor Daniel Rubinfeld of the University of California-Berkeley notes that:

The result [of the elimination of the reserve clause] was an interesting experiment in labor market economics... Before 1975, expenditures on players' contracts made up approximately 25% of all team expenditures. By 1980, those expenditures had increased to 40%.<sup>357</sup>

Another introductory microeconomics textbook summarizes the "impact of free agency" in professional sports by observing that "[f]ree agency has increased player *share of total revenues* in each of the major men's team sports."<sup>358</sup>

101. Consistent with these analyses, in his consulting work, Zuffa's own expert Dr. Topel has analyzed payments to labor as a share of revenue in labor markets for professional athletes.<sup>359</sup> In a study commissioned by NFL Players Association, Dr. Topel analyzes "[t]he percentage of total revenues paid to [NFL] players."<sup>360</sup> Based on an analysis of "Total Cash Player Costs as a Percentage of Total Revenue,"<sup>361</sup> the study finds that:

[P]layers' percentage did not keep pace with the growth in NFL revenues after 2000. To the extent the 2006 CBA [Collective Bargaining Agreement] extension resulted in increases in the salary cap, those increases have raised the players' percentage so that it is closer to the historical average of approximately 59 percent of revenue. Reducing the players' percentage, as the owners suggest, would not redress a situation in which the players are

357. ROBERT PINDYCK & DANIEL RUBINFELD, MICROECONOMICS 549 (Pearson 8th ed. 2013). Dr. Oyer admitted that this is a "well respected" and standard economics textbook. Oyer Dep. at 13:24-14:4; 14:10-11.

358. LIBBY RITTENBERG & TIMOTHY TREGARTHEN, PRINCIPLES OF MICROECONOMICS 356 (Flat World Knowledge 2009) (emphasis added).

359. Kevin Murphy and Robert Topel, "The Economics of NFL Team Ownership," Chicago Partners (2009) (prepared at the request of the National Football League Players' Association).

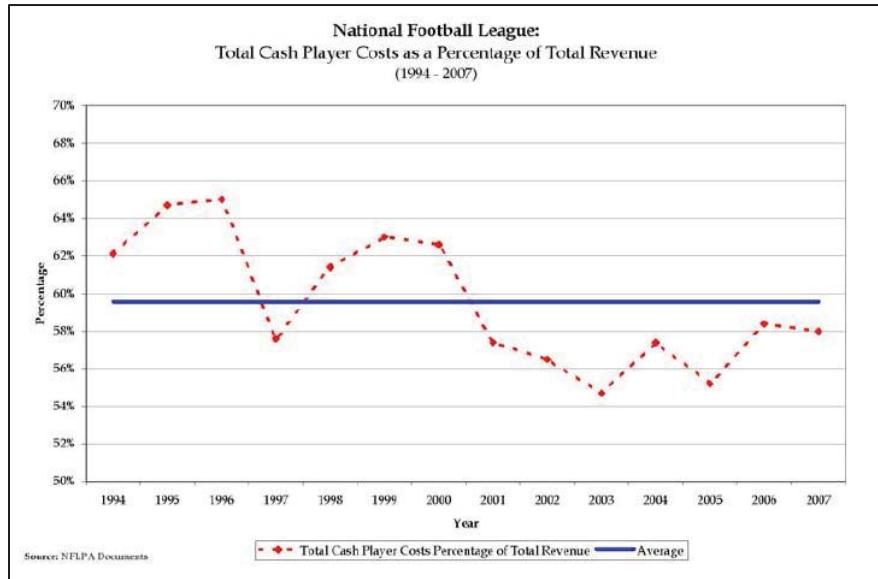
360. *Id.* at 2.

361. *Id.* at 15 (Figure 12).

receiving a higher than average percentage, but would instead reduce the players' percentage to a level below the historical average.<sup>362</sup>

Dr. Topel even included a figure (reproduced below) showing the football players' share of total revenue over time.

FIGURE 1:  
EXAMPLE OF LABOR SHARE ANALYSIS BY DR. TOPEL



Source: Murphy and Topel, *supra*, Figure 12.

The study goes on to analyze compensation to rookie players as a percentage of team salary caps, and finds that "the average rookie pool has declined relative to the per team salary cap from approximately 7 percent in 1994 to just under 4 percent in 2008."<sup>363</sup>

102. Dr. Topel's extensive focus on the percentage of revenue paid to NFL players is inconsistent with Dr. Oyer's claim that "labor share is not an economically accepted way to evaluate worker compensation,"<sup>364</sup> as well as Dr. Topel's patently incorrect claim in this case that

362. *Id.* at 15.

363. *Id.* at 16. In addition, Dr. Blair himself compared UFC athlete share of revenue to that in other sports in a presentation to the FTC. Blair Dep. at 254:25-255:3 ("[A]s I recall, the inquiry was that the FTC was interested in what ... share ... the athletes were getting in revenues in ... sports other than MMA."). Thus, in his capacity as an economic consultant, Dr. Blair has analyzed wage shares in MMA.

364. Oyer Report Part V.A.

standard microeconomics has nothing to say about the percentage of revenue paid to workers.<sup>365</sup>

Dr. Topel does not mention his own prior work analyzing labor shares in his expert report, just as he fails to review the sports economics literature where use of wage shares as a means to evaluate the exercise of monopsony power is widespread.

## **2. Economists Have Also Studied Wage Shares in a Variety of Non-Sports Industries Including for Purposes of Assessing Monopsony Power**

103. Economists have analyzed wage shares in a range of non-sports industries. Under competition, standard economic models predict that each input to production (including labor) receives its MRP, which in turn predicts the share of revenue paid to that input.<sup>366</sup> Recognizing that “[i]n a world of perfect competition, the output contribution of individual production factors equals their respective revenue shares,”<sup>367</sup> a 2013 study published in the *Journal of Applied Econometrics* analyze firm-level data from 38 manufacturing industries.<sup>368</sup> The authors measure market power in these industries by analyzing discrepancies between the revenue shares that would be predicted for labor under an assumption of competitive markets, based on labor’s productivity, and those that are actually observed in the data.<sup>369</sup>

104. Another recent example, cited in the Oyer Report, is a 2017 paper, published in the prestigious *American Economic Review Papers and Proceedings*, titled “Concentrating on the Fall

365. Topel Report ¶¶130-132.

366. Elementary economics shows that competitive firms pay labor a share of revenue commensurate with labor’s productivity, based on the marginal product of labor. See, e.g., ROY RUFFIN & PAUL GREGORY, PRINCIPLES OF MICROECONOMICS 331-36 (Harper Collins 5th ed. 1993) (explaining that standard economic theory makes predictions regarding the share of payments made to labor that are borne out in the data; economic theory explains why the share of payments going to labor remained relatively constant over several decades (from 1948 to 1990) even though the capital stock more than doubled over this time period).

367. See, e.g., Sabien Dobbelaere & Jacques Mairesse, *Panel Data Estimates of the Production Function and Product and Labor Market Imperfections*, 28 JOURNAL OF APPLIED ECONOMETRICS 1-46, 2 (2013) [hereafter, “Dobbelaere & Mairesse”].

368. *Id.* at 3.

369. *Id.*

of the Labor Share.” This article provides an analysis of the broad-based decline in the labor share that has been observed in industries throughout the U.S. economy in recent decades.<sup>370</sup> As Dr. Oyer observes correctly, the authors study “employee compensation costs *as a fraction of total revenues....*”<sup>371</sup> Based on their analysis of establishment-level data drawn from the U.S. Census, the authors find that the labor share has fallen the most in those industries where concentration and productivity have increased the most.<sup>372</sup> Strangely, the Oyer Report claims, based on this single study, that monopsony power cannot be invoked to explain declining labor shares in *any* industry (including presumably MMA).<sup>373</sup> But the study reaches no such conclusion; its findings relate to broad-based trends spanning hundreds of industries.<sup>374</sup> Moreover, as Dr. Oyer concedes, the authors of “Concentrating on the Fall of the Labor Share” mention “unfair practices on the part of firms”,<sup>375</sup> as a “a possible contributing factor”<sup>376</sup> to the observed decline in the labor share.<sup>377</sup> That the authors would even consider this hypothesis—let alone conduct an in-depth empirical analysis of labor shares in hundreds of industries to explore it—contradicts Dr. Oyer’s blanket claims

370. David Autor, David Dorn, Lawrence Katz, Christina Patterson, and John Van Reenen, *Concentrating on the Fall of the Labor Share*, 107(5) AMERICAN ECONOMIC REVIEW: PAPERS & PROCEEDINGS 180–185 (2017) [hereafter “Autor, et al.”]. The Oyer Report cites, at ¶33, a working paper version of the article, rather than the published version. See David Autor, David Dorn, Lawrence F. Katz, Christina Patterson, & John Van Reenen, “The Fall of the Labor Share and the Rise of Superstar Firms,” Working Paper (May 1, 2017), available at: <https://economics.mit.edu/files/12979>.

371. Oyer Report ¶33 (emphasis added).

372. Autor, et al. at 181, 184 (“The findings suggest that a positive productivity-concentration relationship will most likely feature in any plausible explanation of rising industry concentration.”).

373. Oyer Report ¶33. Dr. Oyer also cites a finding in the working paper version of Autor, et al. indicating that sectors with declining labor shares tend not to see declines in the absolute wage. *Id.* ¶34. It is unclear why Dr. Oyer believes this finding is inconsistent with my own analysis. Nothing in my analysis requires that labor shares and wage levels must move in the same direction. For example, if Fighters’ MRP is increasing over time, the level of compensation paid to fighters will also tend to increase, even when monopsony power is being exercised. The exercise of monopsony power would allow Zuffa to prevent Fighter compensation from increasing as rapidly as it would if Fighters were paid consistent with their MRP, as would be the case under competition. This explains why Fighter Share might decline when monopsony power is exercised, despite increases in the level of Fighter compensation.

374. Autor, et al. at 181 (“Our methodology yields 676 industries, 388 of which are in manufacturing.”).

375. Oyer Report ¶33.

376. *Id.*

377. *Id.*

regarding the use of labor shares by labor economists.<sup>378</sup> The authors also provide a brief review of the economic literature on labor shares, starting in the 1960s and continuing through the present;<sup>379</sup> as explained below, this literature includes studies that explicitly link the observed decline in the labor share to the exercise of monopsony power.

105. In his own published work, Dr. Oyer has recognized the significance of share-based analysis in labor economics. In a 2011 article published in the *Handbook of Labor Economics*, he reviews so-called “principal-agent” models of compensation, which analyze the ways in which firms provide incentives to their employees.<sup>380</sup> As Dr. Oyer observes, the theory predicts that employers will structure their compensation according to an “optimal sharing rule,” which determines the share of output that employees are paid.<sup>381</sup> Dr. Oyer also recognizes that such sharing rules are “common in organizations.”<sup>382</sup> Put differently, share-based compensation is predicted by economic theory *and* is commonly observed in practice. Whenever incremental revenue is traceable to a worker’s effort, it makes sense to compensate the worker (in whole or in part) as a percentage of the incremental revenue generated by said employee; the incremental

378. As Dr. Oyer recognizes, Professor David Autor of MIT, the lead author of Autor, et. al., is a well-known labor economist. *Id.* Professor Autor has published a large number of articles on labor economics, including in the *Journal of Labor Economics*, which is edited by Dr. Oyer. See <https://economics.mit.edu/faculty/dautor/cv>

379. Autor, et al. at 180; *id* at 185 (citing Nicholas Kaldor, *Capital Accumulation and Economic Growth*, THE THEORY OF CAPITAL, 177-222 (F.A. LUTZ AND D.C. HAGUE EDS. St. Martin’s Press 1961); Michael W.L. Elsby, Bart Hobijn, and Aysegul Sahin, *The Decline of the U.S. Labor Share*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 1-42 (2013) [hereafter “Elsby et. al.”]; Loukas Karabarbounis and Brent Neiman, *The Global Decline of the Labor Share*, 129 (1) QUARTERLY JOURNAL OF ECONOMICS, 61-103; Matthew Rognlie, *Deciphering the Fall and Rise in the Net Capital Share: Accumulation or Scarcity?*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 1-69 (2015); Simcha Barkai, “Declining Labor and Capital Shares,” University of Chicago New Working Paper Series No. 2 (November 2016), available at <https://research.chicagobooth.edu/~media/5872fbeb104245909b8f0ae8a84486c9.pdf>.

380. Paul Oyer & Scott Schaefer, *Personnel Economics: Hiring and Incentives*, in, IV THE HANDBOOK OF LABOR ECONOMICS, Ch. 20 (ORLEY ASHENFELTER AND DAVID CARD EDS. 2011).

381. *Id.* at 1774-1775.

382. *Id.* 1775. See also Oyer Dep. at 183:3-5; *id.* at 184:13-17 (“Q: So if the worker contributes to the firm acquiring some net revenue, this sharing rule could be used to determine what share of that revenue the employer should pay the worker; is that correct? A. Right.”); *id.* at 200:20-201:3 (admitting that in thicker, more competitive labor markets, employers get a smaller share of surplus, which is another way of saying a smaller share of revenue).

revenue serves as an upper bound on that worker's marginal revenue product. In his deposition, Dr. Oyer admitted that the payment to labor under the optimal sharing rule can be denominated in terms of share of Event Revenue.<sup>383</sup>

106. In the same article, Dr. Oyer also observes (correctly) that monopsony power allows firms to extract a greater share of production from labor than they could otherwise: He reviews economic literature documenting the fact that, all else equal, employers in more competitive ("thicker") labor markets are forced to pay a greater share of producer "surplus" to labor than are employers with more monopsony power:

Larger and more concentrated populations typically lead to thicker labor markets which may reduce search costs and can also lead to better average matches between firms and workers. While this will tend to increase surplus, *thicker labor markets also lead to greater competition in the labor market*. So, while total surplus may be greater in thicker labor markets, *firms may have to settle for a smaller share of that surplus because it is more difficult to generate monopsony power.*<sup>384</sup>

The *Handbook of Labor Economics* also includes a chapter by Professor Alan Manning,<sup>385</sup> an economist cited frequently by Dr. Oyer.<sup>386</sup> As Dr. Manning explains, there is an extensive theoretical and empirical literature in labor economics that examines "how rents [profits] are shared between employer[s] and worker[s]."<sup>387</sup>

383. Oyer Dep. at 183:3-5; *id.* at 185:11-15 ("Q: So if the worker contributes to the firm acquiring some net revenue, this sharing rule could be used to determine what share of that revenue the employer should pay the worker; is that correct? A. Yes.").

384. Oyer and Schaefer at 1813-14 (emphasis added), citing Christopher H. Wheeler, *Search, Sorting, and Urban Agglomeration*, 19 (4) JOURNAL OF LABOR ECONOMICS, 879-899 (2001); Fredrik Anderson, Simon Burgess, & Julia Lane, *Cities, Matching and the Productivity Gains of Agglomeration*, 61 (1) JOURNAL OF URBAN ECONOMICS, 112-128 (2007); M.L. Freedman, "Preference-based Sorting and Matching in Industrial Clusters" (Cornell University 2009); Luis Garicano & Thomas Hubbard, *Managerial Leverage is Limited by the Extent of the Market: Hierarchies, Specialization, and the Utilization of Lawyers' Human Capital*, 50 (1) THE JOURNAL OF LAW AND ECONOMICS, 1-43 (2007); Luis Garicano & Thomas Hubbard, *Specialization, Firms, and Markets: The Division of Labor Within and Between Law Firms*, 25 (2) THE JOURNAL OF LAW, ECONOMICS, & ORGANIZATION, 339-371 (2008).

385. Alan Manning, *Imperfect Competition in the Labor Market*, in IV THE HANDBOOK OF LABOR ECONOMICS, Ch. 11 (ORLEY ASHENFELTER AND DAVID CARD EDS 2011).

386. Oyer Report ¶¶22-24.

387. Manning, *supra*, at 997. See also Patrick Kline, Neviana Petkova, Heidi Williams & Owen Zidar, "Who Profits from Patents? Rent-Sharing at Innovative Firms," IRLE Working Paper #107-17 (September 2017). (Analyzing

107. Finally, Dr. Oyer attempts to dismiss share-based analysis of compensation as only relevant to macroeconomics, in studies of “wages as a fraction of Gross Domestic Product, some other macroeconomic measure of the size or the health of the economy, or a measure of the size of an entire sector of the economy.”<sup>388</sup> Dr. Oyer also claims that “[t]hese studies do not equate labor’s share to the market power employers hold over labor.”<sup>389</sup> Dr. Oyer is wrong here too. *First*, economists can and do apply the same fundamental class of economic models to microeconomic data. Indeed, the Autor, et al. (2017) paper cited by Dr. Oyer himself does not use macroeconomic data, but instead analyzes the labor share using *firm-level* data compiled from the U.S. Census, spanning over 600 industries.<sup>390</sup> Thus, the very study Dr. Oyer cites is a microeconomic analysis, performed by labor economists.<sup>391</sup> Similarly, the 2011 *Journal of Applied Econometrics* publication cited above uses firm-level data, not macroeconomic data (such as gross domestic product, exports, or inflation).<sup>392</sup> *Second*, none of the sports economics literature reviewed in the

firm-level data on new patent awards, and finding that firms share approximately one third of the revenue generated by patents with their employees). *See also* Louis N. Christofides & Andrew J. Oswald, *Real Wage Determination and Rent-Sharing in Collective Bargaining Agreements*, 107(3) THE QUARTERLY JOURNAL OF ECONOMICS, 985-1002 (1992). (Presenting evidence that the collective bargaining strength of workers allows them to gain a greater share of firm rents). *See also* David Blanchflower, Andrew Oswald, & Peter Sanfey, *Wages, Profit, and Rent-Sharing*, 111(1) THE QUARTERLY JOURNAL OF ECONOMICS, 227-251 (1996). (Panel study on 200,000 full-time full-year workers in U.S. manufacturing firms from 1964-1985, finding that as firms become more profitable, wages rise over time, indicating that firms share rents with their employees). *See also* David Card, Francesco Devicienti, & Agata Maida, *Rent-sharing, Holdup, and Wages: Evidence from Matched Panel Data* 81(1) REVIEW OF ECONOMIC STUDIES 84-111 (2014) (Analyzing Social Security earnings records for workers linked to detailed financial data for their employers, and finding evidence that firm-level bargaining splits rents between employers and employees).

388. Oyer Report ¶31.

389. *Id.*

390. Autor, et al., *supra* at 181 (“We use data from the US economic census, conducted every five years to enumerate all establishments in select sectors on current economic activity. We focus on the economic census from 1982 to 2012 for six large sectors...For the six sectors, the census reports each establishment’s annual payroll, output, employment, and an identifier for the firm to which the establishment belongs... To implement our industry-level analysis, we assign each establishment in a given year to a 1987 SIC-based time-consistent industry code as described in Autor et al. (2017). Our methodology yields 676 industries, 388 of which are in manufacturing.”) (emphasis added).

391. As explained above, Professor David Autor of MIT, the lead author of Autor, et al., is a well-known labor economist, who has published a large number of articles on labor economics, including in the *Journal of Labor Economics*, which is edited by Dr. Oyer. *See* <https://economics.mit.edu/faculty/dautor/cv>.

392. Dobbelaere & Mairesse, *supra*, at 2 (discussing a “large panel of French manufacturing firms”).

prior section consists of macroeconomic studies. *Third*, even the macroeconomic literature analyzes labor shares to draw inferences regarding market power, despite Dr. Oyer's claim to the contrary.<sup>393</sup> For example, a paper titled "Declining Labor and Capital Shares" concludes that a "decline in the labor share is strongly associated with an increase in [firm] concentration," and that this is "consistent with a model in which firms face barriers to entry, where prices are the result of monopolistic competition."<sup>394</sup> Similarly, a 2017 study concludes that rising market power explains the observed decline in the labor share in the U.S. economy.<sup>395</sup> A 2013 paper observes that "the constancy of the share of income that flows to labor has been taken to be one of the quintessential stylized facts of macroeconomics,"<sup>396</sup> but that in recent years "prominent measures of labor's share in the United States have declined significantly."<sup>397</sup> That study considers de-unionization as one possible contributing factor in the global decline in the labor share, noting that "[t]he bargaining power of unions tends to increase workers' share of the surplus generated in the production process."<sup>398</sup> In summary, Drs. Oyer, Topel, and Blair are incorrect to assert labor share is an irrelevant metric to study market power in labor economics specifically or in economics generally.

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393. Oyer Report ¶31.

394. Simcha Barkai, "Declining Labor and Capital Shares," University of Chicago New Working Paper Series No. 2 (November 2016), available at <https://research.chicagobooth.edu/~media/5872fbeb104245909b8f0ae8a84486c9.pdf>, at 27 (emphasis added). The study "contributes to a large literature on the macroeconomic importance of profits and markups." *Id.* at 4. It uses data from the National Income and Productivity Accounts, and other data from the Bureau of Economic Analysis, the government agency that publishes data on Gross Domestic Product and other macroeconomic variables. *Id.* at 7 - 8.

395. Jan De Loecker & Jan Eeckhou, "The Rise of Market Power and the Macroeconomic Implications," NBER Working Paper No. 23687 (August 2017), available at <http://www.nber.org/papers/w23687>

396. Elsby et al. at 2.

397. *Id.* at 2.

398. *Id.* at 38 (citing Barry Hirsch, *Unions, Dynamism, and Economic Performance*, in MICHAEL WACHTER AND CYNTHIA ESTLUND, EDS., RESEARCH HANDBOOK ON THE ECONOMICS OF LABOR AND EMPLOYMENT LAW (Edward Elgar Series of Research Handbooks in Law and Economics 2012)). Elsby et al. find that "deunionization can explain 1.5 percentage points of the drop in the aggregate payroll share," although the result is not statistically significant and the evidence is therefore inconclusive. Elsby et al. 39.

### 3. Wage Shares, Not Levels, Are The Appropriate Dependent Variable For My Impact Regressions

108. Drs. Topel and Oyer both claim that my impact regressions should have used compensation levels, as opposed to wage shares, as the dependent variable in my impact regressions.<sup>399</sup> They are wrong. *First*, as explained above, wage shares are commonly used to study monopsony power, particularly in professional sports, where levels-based analyses can be highly misleading, and where there is a clear-cut connection between revenues generated at athletic events, compensation, and athlete MRP.<sup>400</sup> *Second*, this clear-cut connection is, if anything, even more apparent in a combat sport such as MMA, in which individual Fighters (as opposed to teams, leagues, division rivalries, etc.) are central to drawing audiences.<sup>401</sup> As Dr. Topel admitted in his deposition, “revenues are part of willingness to pay for an athlete... if people didn’t want to come to fights we couldn’t pay the fighters. That’s – that’s pretty basic.”<sup>402</sup> *Third*, my impact regression uses Event Revenue, which is calculated from various revenue streams

399. Topel Report ¶¶142-149; Oyer Report ¶¶47-50.

400. Blair Dep. at 20:5-19 (The fact that in sports, fans care about the identity or performance of the individual workers is “a specific feature of the demand on the part of the fan base, or consumers ... that can influence how many people are willing to buy tickets to watch ... [a]nd how much they’re willing to pay for those tickets.”).

401. Singer Report ¶20; *id.* Part III.C.1; *see also* McGowan and Mahon (2015) at 1046-1047 (“The most important takeaway is that the identities of the fighters competing matter more than any title they would be competing for. Thus, when it comes to generating abnormally high PPV buy rates, the fighter has more drawing power than the brand. This conclusion could be used as an argument for fighters to get a larger percentage of the PPV revenue, since the fighters themselves, not the UFC titles, are what truly drive PPV buy rates.”)

402. Topel Dep. at 202:21-203:3 (“Q. The second to last sentence of paragraph 200 at page 88 says ‘Lower revenues would likely lead to lower athlete compensation, right? A. Yes. Q. Why do you believe that? A. Because that’s – the revenues are part of willingness to pay for an athlete, and if – look if people didn’t want to come to fights we couldn’t pay the fighters. That’s – that’s pretty basic.’”). Dr. Topel opined in his report and in his deposition that Zuffa’s Fighters are “effective revenue generators.” *Id.* at 24:20-25:9 (“Q. Okay. So if what Zuffa does is . . . makes its fighters more effective revenue generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q. And is it your opinion that Zuffa is particularly good at is causing its fighters to be more effective revenue generators? A. I think that’s Zuffa’s position and I think that’s what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes.”). Dr. Topel also conceded that both Fighter compensation and Event Revenue are positively related to the willingness to pay to watch MMA fighters. *Id.* at 420:10-19). *See also id.* at 36:24-37:4 (“Q. What you’re saying is that one of the ways in which Zuffa has become successful is by boosting the ability of its fighters to generate revenues when they fight, correct? A. Yeah. The point of investing is to generate revenues.”). *See also* Topel Report ¶311. Similarly, Dr. Oyer concedes that “[h]aving good fighters” is one factor that would increase Zuffa’s revenue. Oyer Report ¶36.

specific to a given Live MMA Event, such as ticket sales and PPV revenue.<sup>403</sup> Event Revenue is therefore a good proxy for the MRP of the specific Fighters participating in a specific Live MMA Event.<sup>404</sup> As Dr. Oyer admitted during his deposition, the “measurability of...[workers’] output”<sup>405</sup> determines whether revenue is a reasonably proxy for MRP. Event Revenue provides a reasonably direct and reliable measure of Fighters’ output here. *Fourth*, Zuffa itself repeatedly used wage shares in analyzing its own business, as Dr. Topel admits.<sup>406</sup> For example, Zuffa itself was focused on wage shares in its ordinary course of business and in readying its sale to WME. Just prior to the sale, Zuffa presented its annual wage shares to WME, noting the “Risk of Fighter Compensation Inflation” in the aggregate.<sup>407</sup> Thus, although Zuffa carefully selected fighter-pay schedules, which determine the level of Fighter compensation, Zuffa did so subject to the constraint that the sum of all payouts to Fighters should not exceed a pre-determined share of revenue. When presented with this evidence during his deposition, Dr. Topel admitted that Zuffa relied on wage shares in its

403. As explained in my initial report, the Event Revenue used in my regression analysis were calculated using Zuffa’s P&L statements, and include Ticket Sales/Site Fees PPV/Broadcast Sales/Fees (including “Web Buys” and “Other”), event-specific Merchandise, and event-specific Sponsorships. Singer Report ¶181, n. 451.

404. Dr. Oyer incorrectly critiques me for analyzing as “the percentage of a firm’s *total revenues* paid out as workers’ compensation.” Oyer Report ¶8 (emphasis added). Yet, as Dr. Oyer himself recognizes, my impact regression measures a Fighter’s wage share not as a proportion of Zuffa’s *total* revenue, but rather as the share of event-specific revenue paid to the Fighter in question. *Id.* ¶9.

405. Oyer Dep. at 67:11-14.

406. Dr. Topel Admits that Zuffa used wage share in the course of its business and in sale to WME. Topel Dep. at 235:22-236:2 (discussing WME-ZUFFA-00001150) (“Q. [I]s it fair to say that in the course of its business Zuffa or its parent analyzed fighter compensation in terms of fighter share of revenue. A. They calculated this and they thought the information was relevant.”). *See also id.* at 237:16-22 (discussing WME-ZUFFA-00001150) “Q. Why do you think WME and/or Zuffa used a wage share comparison in a document assessing the potential value of Zuffa as an investment? A. Maybe because the - it’s a relevant calculation for knowing the value of the organization, I assume.” Dr. Topel also admits that Zuffa used wage share to “evaluate fighter compensation.” *Id.* at 246:4-13 (discussing ZFL-2677898); *id.* at 245:15-18 (admitting he relied upon this document in his report). Dr. Topel also admits that Zuffa kept track of athlete costs as a share of revenue. *Id.* at 522:1-4 (discussing ZFL-2677898) (“Q. So it’s fair to say that in this document the UFC is, in part, presenting athlete costs as a share of revenues; is that right? A. They keep track of it.”). Dr. Topel admits that Zuffa kept track internally of fighter compensation as a percentage of event revenue. *Id.* at 249:21-24 (discussing ZFL-1484034-37) (“Q. Is it fair to say that Zuffa kept track internally of fighter compensation as a percentage of event revenue? A. Evidently.”).

407. WME-ZUFFA-00001150, at 11. *See also* ZFL-2677898-7967, at 957 (Zuffa using “Athlete Costs” as a “% Rev”, among other metrics, to evaluate fighter compensation).

ordinary course of business because “it’s a relevant calculation for knowing the value of the organization.”<sup>408</sup>

109. *Fifth*, a levels-based analysis, which Zuffa’s economists advocate, would be highly misleading, for the same basic reasons (discussed above) that levels-based analyses can be misleading in professional sports generally. A comparison of levels ignores Zuffa’s growing Event Revenue, which reflects an increase in Fighters’ MRP. For similar reasons, the *level* of compensation paid to a Strikeforce fighter prior to Zuffa’s acquisition of Strikeforce is not a suitable proxy for the compensation that Zuffa would have paid its Fighters in a competitive market. The Challenged Conduct blocked rivals from access to a key input necessary for a successful MMA promotion—namely, a deep pool of talented Fighters—which suppressed the revenues and profitability of other MMA promoters. This artificial reduction in revenues, in turn, suppressed the level of compensation that Strikeforce (and other non-Zuffa promoters) could afford to pay their Fighters.<sup>409</sup> Zuffa’s economists recognize that Strikeforce (and other MMA promotions) posed no significant economic threat to Zuffa,<sup>410</sup> and emphasize that MMA promoters such as Strikeforce and Bellator consistently failed to achieve profitability.<sup>411</sup> For similar reasons, the *level* of compensation paid to a Zuffa Fighter in (say) 2011 is not a suitable proxy for the

408. Topel Dep. at 237:16-22; *id.* at 235:22-236:2 (admitting that over the course of its business Zuffa or its parent analyzed fighter compensation in terms of fighter share of revenue).

409. Singer Report ¶¶156-166; *id.* ¶¶104-107, ¶¶134-140. See also *id.* ¶183, n. 454 (“although the Challenged Conduct, by reducing revenue opportunities for rival promoters, might have suppressed the *level* of compensation that Strikeforce (and other would-be rivals) could afford to pay to Fighters, the *share* of revenue paid to Fighters by Strikeforce remains an economically relevant benchmark for estimating but-for compensation”) (emphasis in original).

410. Dr. Topel also admitted that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa’s market share in either the input or output markets. Topel Dep. at 370:25-371:13 (“A. It’s been pretty stable over time”). Dr. Topel also admitted that at the time they were purchased, none of the promotions that Zuffa acquired presented a significant economic threat to the UFC. *Id.* at 372:22-373:13. Similarly, Dr. Topel claims in his report that none of the MMA promotions that Zuffa has acquired, including relatively prominent promotions such as Pride and Strikeforce, had any substantial market power or share. Topel Report ¶172.

411. Blair Report ¶74; Davis Report ¶20. As explained in Part IV.A, that other MMA promoters have sometimes failed to achieve profitability does not imply that the share of revenue that these rivals pay to their Fighters is an unreliable competitive benchmark.

compensation that would prevail in a competitive market in (say) 2015; a comparison of levels fails to control for growing Zuffa Event Revenue, and increasing MMA industry revenues generally, which determines the upper bound of Fighters' compensation and reflects an increase in Fighters' MRP.

**D. The So-Called “Corrected” Impact Regressions Submitted by Zuffa’s Economists Are Fatally Flawed**

110. Both Dr. Topel and Dr. Oyer present regression models that use the level of Fighter compensation, rather than the Fighter Share, as the dependent variable.<sup>412</sup> As explained below, these purported corrections are fatally flawed.

**1. Zuffa’s Economists Assume Nonsensically That Event Revenue Is Unrelated to Fighter MRP, Fighter Compensation, or Both**

111. Both Dr. Topel and Dr. Oyer present regressions with the level of Fighter compensation as the dependent variable, without accounting for Event Revenue in the analysis.<sup>413</sup> That is erroneous: Regardless of whether the labor market is competitive or a monopsony, Fighter compensation will be correlated with Fighter MRP, although compensation will always remain below MRP under monopsony conditions.<sup>414</sup> In addition, an increase in Fighter MRP will, by definition, cause Event Revenue to increase. Therefore, the level of Fighter compensation will necessarily be correlated with Event Revenue. Dr. Oyer’s regression models, by excluding Event Revenue, assume nonsensically that Zuffa’s Event Revenue is unrelated to Fighter MRP, Fighter compensation, or both.

412. Topel Report Exhibit 13; Oyer Report Table 1. Both reports use the natural logarithm of Fighter compensation as the dependent variable.

413. Topel Report Exhibit 13, columns (1) – (3); Oyer Report Table 1.

414. Blair Sports Econ at 354. Dr. Topel admitted in his deposition that “if there’s monopsony power in the market, the athlete will get paid below his marginal revenue product.” Topel Dep. 46:4-10 (“Q. So if the market’s competitive, the athlete will get paid equal to his marginal revenue product; and if there’s monopsony power in the market, the athlete will get paid below his marginal revenue product, correct? A. Yeah. All athletes, not just Zuffa.”).

112. Zuffa's economists recognize elsewhere that their assumption that fighter compensation can be meaningfully evaluated without considering the substantial growth in Event Revenue over time cannot be correct. Dr. Oyer, for instance, concedes that “[h]aving good fighters” is one factor that would increase Zuffa’s revenue.<sup>415</sup> In other words, he recognizes that Fighters contribute to revenue growth, thereby contradicting the premise of his regression model that divorces Fighter compensation from the revenues they generate. Dr. Oyer also acknowledges that plaintiffs’ economic expert in *High-Tech Employee* controlled for employer revenue when analyzing the suppression of compensation among technical workers in Silicon Valley.<sup>416</sup> Similarly, Dr. Blair admits that the unique skills and other athlete attributes play an important role in the revenues generated by sports organizations, because the identify or performance of the individual workers is “a specific feature of the demand on the part of the fan base, or consumers ... that can influence how many people are willing to buy tickets to watch ... [a]nd how much they’re willing to pay for those tickets.”<sup>417</sup>

113. For his part, Dr. Topel claims that Zuffa worked to make its Fighters “more effective revenue-generators.”<sup>418</sup> Dr. Topel admitted in his deposition that Zuffa’s success is driven by increases in Fighter MRP, which are reflected in increased Event Revenue.<sup>419</sup> Dr. Topel also opined that Zuffa’s promotional efforts cause Fighters to bring in more revenue than they

415. Oyer Report ¶36. One of Dr. Oyer’s critiques of my regression relies on plaintiffs’ economists’ regression in *High-Tech Employee*. As explained below, this critique is incorrect. See Part III.D.2, *infra*.

416. *Id.* ¶45.

417. Blair Dep. at 18:7-14, 20:15-19.

418. Topel Report ¶311.

419. Topel Dep. at 23:24-24:3 (“Q. So when Zuffa makes its fighters more effective revenue generators, they’re able to generate more revenues when they fight; is that fair? A. Yes.”); *id.* at 24:20-25:9 (“Q. Okay. So if what Zuffa does is makes it – makes its fighters more effective revenue generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q. And is it your opinion that Zuffa is particularly good at is causing its fighters to be more effective revenue generators? A. I think that’s Zuffa’s position and I think that’s what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes.”).

would otherwise.<sup>420</sup> In other words, Dr. Topel appears to understand and accepts the direct connection between growth in Fighter MRP and growth in Event Revenue.

114. Dr. Topel's own regression models confirm empirically that Event Revenue cannot properly be excluded from the regression: In some variations of his regressions, Dr. Topel does include Event Revenue as an explanatory variable.<sup>421</sup> And when he does, Event Revenue is invariably positive and highly statistically significant, indicating that Fighters are indeed paid a portion of Event Revenue.<sup>422</sup> Thus, Dr. Topel's own analysis confirms empirically that the regressions performed by both Drs. Topel and Oyer that exclude Event Revenue are misspecified.<sup>423</sup> In addition, as explained below, the manner in which Dr. Topel attempts to control for

420. *Id.* at 77:22-78:6 (“Q. So, in your view, because Zuffa has invested in promoting these athletes they ass [sic] as a group are more valuable...to a rival promoter than unranked fighters sitting in an MMA gym somewhere; is that right? A. I think what you said is right, yeah. Q. And what it means to be more valuable in this context is these fighters are capable of bringing in more revenues when they fight, correct? A. Yeah ...”). *See also id.* at 36:24-37:4 (“Q. What you’re saying is that one of the ways in which Zuffa has become successful is by boosting the ability of its fighters to generate revenues when they fight, correct? A. Yeah. The point of investing is to generate revenues.”). Dr. Topel admitted that “one of the reasons why athlete talent is valuable is because the athletes are capable of generating revenues for the organization.” *Id.* at 27:22-25. Dr. Topel admitted that promotion contributes to an athlete’s human capital. *Id.* at 28:22-25.. Dr. Topel acknowledged further that the more human capital an MMA fighter has, all things equal, the more revenues he’s capable of generating when he fights. *Id.* at 29:6-12. And Dr. Topel admitted that Zuffa’s promotional efforts in creating The Ultimate Fighter increased the MRP of MMA fighters generally. *Id.* at 31:7-13 (“Q. Did that promotional effort in creating the show increase the marginal revenue product of MMA fighters generally? A. You mean – when you say generally, you mean like at other – Q. Yes. A. For other promoters and everything, yes.”). *See also id.* at 241:4-16 (discussing WME-ZUFFA-00001150) (“Q. So one thing that WME would want to know before it invests \$4 billion in Zuffa is that Zuffa has its top-ranked fighters under long-term exclusive contracts, rights? A. Yeah. You want to know you’re not going to lose them in the short run. Q. Why is that? Why would you want to know that? A. Because that’s the human capital that’s going to produce revenue for you over the short run and the champions are more valuable than the guys ranked 11 to 15. And if we went down to the people ranked 50, they’d be less valuable still.”). Dr. Topel additionally conceded that a fighter who is a household name because of Zuffa’s investments and promoting that fighter, all things equal, would generate more revenues for the UFC when he fights than a fighter who is not a household name. *Id.* at 37:24-38:8.

421. Topel Report Exhibit 13, columns (4) – (6).

422. *Id.* ¶148 (“event revenue has a statistically significant *positive* effect on athlete pay”) (emphasis original). Dr. Topel admitted that there is a statistically significant relationship between event revenue and fighter compensation. Topel Dep. at 39:19-23 (“Q. You, in fact, found in this case that there’s a statistically significant relationship between Event Revenue and fighter compensation, correct? A. Yes.”).

423. When a regression excludes a relevant variable, the resulting analysis is biased and inconsistent. Wooldridge at 89-94. *See also* Kevin Caves & Hal Singer, *Applied Econometrics: When Can an Omitted Variable Invalidate a Regression?* THE ANTITRUST SOURCE 1-9 (December 2017).

Event Revenue assumes away the effect of the Challenged Conduct, and has technical econometric flaws as well.<sup>424</sup>

**2. Dr. Topel's Only Attempt to Incorporate Event Revenue in the Impact Regression Assumes Away the Effect of the Challenged Conduct and Is Econometrically Flawed**

115. As noted above, alone among Zuffa's economists, Dr. Topel estimates regressions that attempt to control for growth in Event Revenue. In particular, he specifies regressions in which (1) the dependent variable is the level of Fighter Compensation *and* (2) Event Revenue is included as an explanatory (or independent) variable. Dr. Topel is correct that Event Revenue needs to be incorporated into the regression analysis. Fighter compensation is, as he concedes, related to the Event Revenue that the Fighters generate.<sup>425</sup>

116. The issue in dispute, then, is whether Event Revenue should be included in the dependent variable of the regressions—as I have done by using wage share (*i.e.*, compensation as a share of Event Revenue)—or whether it is permissible instead to include Event Revenue as an independent variable—as Dr. Topel has done (in some of his analyses). For two reasons, my approach is proper and Dr. Topel's is not. *First*, including Event Revenue as an independent variable assumes away the very hypothesis we want to test: whether an increase in Zuffa's foreclosure share causes Zuffa to pay Fighters a smaller percentage of Event Revenue (and hence MRP) than Fighters would have been paid in a more competitive market. *Second*, including Event Revenue as an independent variable gives rise to a technical econometric problem called endogeneity, which arises when the dependent variable in a regression—in Dr. Topel's

424. Dr. Topel also claims that his regression model in levels (rather wage shares) nullifies my proof of common impact. Topel Report ¶142. That is incorrect. The question of whether the dependent variable should be wage level or wage share is common to the class, just as the question of whether Zuffa has monopsony power. The proper construction of the dependent variable does not raise individualized issues.

425. Topel Dep. at 418:9-17.

regressions, Fighter compensation—and an independent variable—in Dr. Topel’s regressions, Event Revenue—both correlate positively with a third variable—here, Fighter MRP. Dr. Topel’s regressions assume away the hypothesis we want to test and suffer from endogeneity. My regressions suffer from neither of these flaws and are, therefore, superior.

117. As to the first point, Dr. Topel’s model assumes away the very hypothesis that my impact regressions are designed to test: By putting Event Revenue in the model as an explanatory variable, Dr. Topel’s regressions attempt to measure the effect of Zuffa’s foreclosure share on Fighter compensation, *holding Event Revenue constant*. That implicitly assumes that Zuffa’s foreclosure has no effect on the proportion of Event Revenue paid to Fighters. Thus, Dr. Topel’s regressions, by design, cannot test whether the Challenged Conduct permitted Zuffa to pay Fighters a smaller share of their MRP. In contrast, by using wage share as the independent variable, my regressions are able to test whether an increase in Zuffa’s foreclosure share correlates to a decrease in Fighter compensation as a proportion of Event Revenue.

118. As to the second point, Dr. Topel’s inclusion of Event Revenue as an explanatory (or independent) variable causes technical econometric problems. Both Event Revenue and Fighter compensation are simultaneously determined by Fighter MRP, which cannot be observed directly. In other words, when a Fighter’s MRP increases—when, primarily, a fighter becomes more popular with paying audiences and therefore is capable of generating more revenue when he or she fights—the revenue from the events at which the Fighter competes will increase and so will the compensation the Fighter receives. In Dr. Topel’s deposition, he admitted that an increase in Fighters’ MRP could increase event revenue.<sup>426</sup> He also acknowledged that both Fighter compensation and Event Revenue are positively related to the willingness to pay to watch MMA

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426. *Id.*

fighters.<sup>427</sup> He conceded further that using Event Revenue as an explanatory variable attempting to predict compensation—as he does in his own regression—introduces complicated questions of “causation.”<sup>428</sup>

119. In econometric terms, what this means is that Event Revenue is endogenous.<sup>429</sup> In particular, because Fighter compensation and Event Revenue are jointly determined by Fighter MRP, Dr. Topel’s regressions suffer from a form of endogeneity known as “simultaneity bias.”<sup>430</sup> When a regression suffers from simultaneity bias, the coefficients on both the endogenous variables in the model and the exogenous control variables are biased and inconsistent.<sup>431</sup> In other words, regressions that suffer from simultaneity bias, like Dr. Topel’s here, are unreliable. As acknowledged by Dr. Topel, an econometrician “can’t learn much from [a] regression” that is plagued by simultaneity bias.<sup>432</sup> Dr. Oyer also admitted that endogeneity bias invalidates regression estimates.<sup>433</sup> In contrast, my own impact regression avoids this serious problem by estimating a “reduced form” model that includes Event Revenue as part of the dependent variable.<sup>434</sup> Removing Event Revenue from the list of independent variables and reclassifying it as a dependent variable appropriately recognizes that Event Revenue is endogenously determined (caused) by the independent variables in the regression model.

427. *Id.* at 420:15-19.

428. *Id.* at 39:24-40:4.

429. Wooldridge at 88.

430. *Id.* at 546 (“Another important form of endogeneity of explanatory variables is simultaneity. This arises when one or more of the explanatory variables is jointly determined with the dependent variable.”). *See also id.* at 546-552.

431. *Id.* at 550-552.

432. Topel Dep. at 526:19-21.

433. Oyer Dep. at 157:14-17 (admits that in building a regression a statistician wants to avoid endogeneity problems); *see also id.* at 155:13-20 (recognizing that the independent variables in a regression must be “exogenous”—that is, free of endogeneity bias).

434. Wooldridge at 518.

120. Dr. Oyer observes correctly that in *High-Tech Employee*, the plaintiffs' economist used a regression in which the dependent variable was employee compensation, and employer revenue was included as a control variable.<sup>435</sup> Because I co-authored an article on *High-Tech Employee*, Dr. Oyer asserts that this is effectively a concession that my impact regression should be run using compensation levels and not wage share.<sup>436</sup> Dr. Oyer is wrong. In *High-Tech Employee*, the Defendants were some of Silicon Valley's largest and most prominent companies, including Apple, Google, Intel, and Adobe.<sup>437</sup> The total revenue earned by a corporation such as Apple is indeed plausibly exogenous to the amount of compensation received by an individual technical employee at Apple: In other words, an increase in the MRP of an individual technical employee would have no material effect on Apple's total corporate revenue. As a result, the plaintiffs' economist in *High-Tech Employee* was justified in including employer revenue as a control variable.<sup>438</sup> In contrast, the revenue that Zuffa earns *at a particular event* is not independent of compensation paid to Fighters *at that event*. Both are determined by the MRP of the Fighters *at that event*. The more popular are the Fighters at an event, all things equal, the more revenue that event will generate and the more those Fighters will be paid. For that reason, a regression model that was appropriate in *High-Tech Employee* would not be appropriate in this litigation.

435. Oyer Report ¶45, citing Kevin Caves & Hal Singer, *Analyzing High-Tech Employee: The Dos and Don'ts of Proving (and Disproving) Classwide Antitrust Impact in Wage Suppression Cases*, 14(3) ANTITRUST SOURCE (2015), at 4 [hereafter, "Caves & Singer (2015)"].

436. *Id.* ("Dr. Singer holds up as an example of appropriate analysis a regression that uses employee compensation (log of compensation, I believe) as the dependent variable and employer revenue as a control variable rather than as the denominator of the dependent variable. But, when running the regressions in the current case, Dr. Singer chose to ignore this and to run the regressions with fighter share (rather than log of fighter pay) as the dependent variable.").

437. Caves & Singer (2015) at 1.

438. Conversely, using labor share as the dependent variable in plaintiffs' regression model in *High-Tech Employee* would not have made sense; the share of Apple's total corporate revenue paid to any individual technical employee is effectively zero.

**3. My Regression Model Continues to Show Impact and Damages Using Dr. Topel’s Own “Stratified Foreclosure Shares”**

121. Dr. Topel calculates “stratified foreclosure shares,” by grouping athletes into five categories based on rank, and then calculating Zuffa’s unweighted foreclosure share for each category.<sup>439</sup> Dr. Topel claims that his analysis of stratified foreclosure shares “offer[s] no evidence that any Zuffa athletes suffered damages from the alleged foreclosure.”<sup>440</sup> After correcting methodological errors in Dr. Topel’s calculations, and using his stratified foreclosure measure, the results once again confirm that Zuffa’s foreclosure of the Relevant Input Markets and Submarket had a negative and significant effect on Fighter Shares. In other words, even using Dr. Topel’s preferred measurement of foreclosure, my regression shows that as foreclosure increased, Fighters’ share of Event Revenue fell substantially.

122. Specifically, when I properly include both data reflecting Zuffa’s bouts over time and Strikeforce pre-acquisition bouts in the regression,<sup>441</sup> the corrected analysis confirms a negative and statistically significant relationship between Zuffa’s foreclosure share and the Fighter Share for each and every one of Dr. Topel’s stratified foreclosure metrics.<sup>442</sup>

**E. Zuffa’s Economists’ Claims Regarding the “Win Flag” Variable and Other Control Variables Are Misleading and Incorrect**

123. In Dr. Oyer’s regressions, the coefficient on the explanatory variable “Win Flag”—an indicator for whether the Fighter won his or her fight in that event—is positive and individually statistically significant.<sup>443</sup> In my impact-regression model, the coefficient on Win Flag is also positive, but the coefficient is not individually statistically significant. Dr. Oyer concludes that this

439. Topel Report ¶¶165-166; *id.* at Exhibit 16.

440. *Id.* ¶166.

441. See Part II.B, *supra*.

442. See Appendix Table A2.

443. Oyer Report, Table 1.

is “further evidence that [Dr. Singer] uses an inappropriate specification that does not properly capture how relevant factors affect fighter compensation.”<sup>444</sup> Dr. Topel makes similar claims regarding the coefficients on the Rank and PPV variables in my model.<sup>445</sup>

124. Zuffa’s economists are wrong. Given the large number of control variables in my impact regression (a total of 270, in addition to 1,396 Fighter fixed effects),<sup>446</sup> it is not at all surprising that the coefficients on some are *individually* statistically insignificant. When multiple variables move together (that is, they exhibit “collinearity”), a regression may find that they are individually statistically insignificant, but this does not imply that these control variables are not *collectively* significant.<sup>447</sup> A standard *F*-test for the *collective* significance of Win Flag and other control variables—all of which are individually statistically insignificant at the five percent level—confirms that these variables are collectively highly statistically significant at the five percent level, indicating that these variables collectively contribute significantly to the explanatory power of the regression.<sup>448</sup> Indeed, when Fighter Share is regressed on Win Flag individually (dropping all other explanatory variables from the model), the coefficient is positive and highly significant. This proves that the Win Flag variable is not “misbehaving” in my model, as Dr. Oyer wrongly asserts. Finally, the coefficient on Win Flag is positive and highly significant when we drop a single variable (such as the number of prior Wins) from my regression model.

444. *Id.* ¶52.

445. Topel Report ¶149.

446. Fighter fixed effects control for all of a Fighter’s individual-specific attributes that remain constant over time.

447. Wooldridge at 96-99.

448. See, e.g., *id.* at 148 (“The *F*-statistic tests whether these variables...are jointly significant.”). An *F*-test for the joint significance of the following control variables reveals that they are collectively significant at the five percent level, even though none is individually statistically significant: Win Flag, PPV, Win Method: Disqualification; Win Method: Decision – Major; Win Method: Decision – Split; Win Method: Decision – Unanimous; Win Method: Knockout / TKO; Win Method: Overturned; Total Knockdowns. The *F*-statistic is 2.0 and *p*-value is 2.6% for my Tracked definition, 1.9 and 3.2% for my Ranked definition, and 2.0 and 2.5% for my Headliner definition.

125. With respect to the Rank and PPV variables singled out by Dr. Topel,<sup>449</sup> as just discussed, although these variables are individually insignificant in my impact regression, they are collectively significant along with other control variables. As discussed above, the coefficients on these variables also have the expected sign and significance when all other control variables are removed from the regression. Again, Dr. Topel's econometric critique has no merit.

126. My own impact regression finds that the control variables "Percent of Strikes Landed"<sup>450</sup> and "Offensive Passes"<sup>451</sup> each have a positive and individually statistically significant effect on Fighter Share, as would be expected.<sup>452</sup> In contrast, the regressions proffered by Zuffa's economists show no significant relationship between these variables and the level of Fighter compensation; the coefficients on each are positive but not statistically significant.<sup>453</sup> Similarly, the coefficient on the control variable "Win Method: Could Not Continue" is negative and statistically significant in my impact regression;<sup>454</sup> the coefficient on this variable is negative but not statistically significant in Zuffa's economists' regressions.<sup>455</sup> But this finding alone does not make my model superior (it is superior for other, valid, reasons explained elsewhere). There is no basis in econometrics for rejecting my regression model in favor of Zuffa's economists' regression models based on the statistical significance of a single control variable out of dozens (particularly when the same logic applied to different control variables would suggest that Zuffa's economists' models should be rejected). It is not uncommon for published, peer-reviewed papers to report regressions with variables whose coefficients are individually statistically insignificant, but are

449. Topel Report ¶149.

450. Percent of Strikes Landed measures the accuracy of a Fighter's kicks and punches during a bout. See Singer Report Table 4.

451. Offensive Passes measures the number of position improvements that a Fighter achieves during a bout. *Id.*

452. *Id.* Table 6.

453. Oyer Report Table 1; Topel Report Exhibit 13 (supporting work papers).

454. Singer Report Table 6.

455. Oyer Report Table 1; Topel Report Exhibit 13 (supporting work papers).

jointly statistically significant.<sup>456</sup> The purpose of my impact regression model is to isolate the impact of Zuffa's foreclosure on the Fighter Share; the coefficient on any individual control variable is not important.

127. Finally, when I alter the specification of my impact regression to align more closely with the regression specification chosen by Zuffa's economists, my impact regressions produce the expected sign and significance on each of the control variables singled out by Zuffa's economists. In their own regressions, Drs. Topel and Oyer defined the dependent variable as the natural logarithm of the absolute level of Fighter compensation.<sup>457</sup> Accordingly, I estimated a variation of my impact regression using the natural logarithm of the Fighter Share as the dependent variable (as opposed to the original version, which uses the Fighter Share in levels, not logarithms). For each measure of the Relevant Input Markets and Submarket, these modified impact regressions yield the expected sign and significance on the WinID, Rank, and PPV variables.<sup>458</sup> This proves that using a dependent variable based on wage share generates the same results that, according to Drs. Topel and Oyer, purportedly make their own, levels-based regressions superior.

#### **F. Dr. Topel's Critiques of the Rank-Based and Revenue-Based Weighting Used in My Analysis Are Without Merit**

128. My initial report explained that using unweighted Fighter counts to calculate Zuffa's market share and foreclosure share would make little economic sense, given that Fighters

456. See, e.g., Gene Grossman & Alan Krueger, *Economic Growth and the Environment* 110(2) QUARTERLY JOURNAL OF ECONOMICS (1995), 353-377, at 363 ("In view of the strong multicollinearity between current and lagged GDP, as well as among powers of GDP, it is difficult to infer much about the individual coefficients. However, in most cases the collection of current and lagged GDP terms is highly significant. It appears therefore that national income is an important determinant of local air and water pollution."). See also Kent Smetters, *Is the Social Security Trust Fund a Store of Value?* 94(2) AMERICAN ECONOMIC REVIEW PAPERS & PROCEEDINGS 176-181, 180 (2004) ("A larger GDP and larger 'wages and salaries' increase the on-budget surplus. (These two variables, however, are highly collinear and, therefore, only jointly significant.)").

457. Topel Report ¶146; Oyer Report ¶48.

458. See Appendix Table A3.

vary in their ability to attract viewers, generate event revenues, and hence their value to an MMA promoter.<sup>459</sup> The purpose of my foreclosure analysis is to assess the competitive effects of the growing share of the Relevant Input Market subject to Zuffa's exclusive contracts. Treating all Fighters as if they were equivalent, when in fact they are not, would give an inaccurate picture of the importance of the extent to which the Challenged Conduct has foreclosed Zuffa's rivals from a critical mass of top Fighters. My initial report uses two alternative weighting schemes to capture differences in the quality of Fighters across different MMA promoters. One is based on Fighters' relative rankings, and the other is based on their associated promoters' PPV and gate revenue.<sup>460</sup> As explained below, Dr. Topel's critiques of these weighting methods are without merit. Moreover, the results of my impact regressions do not hinge on any particular weighting scheme; they are robust to using revenue-based weights, rank-based weights, or even unweighted Fighter counts.<sup>461</sup>

### **1. Dr. Topel's Critiques of Rank-Based Weights Are Incorrect**

129. My initial report shows that my impact regressions are robust to alternative weighting schemes, including when Fighters are weighted by the inverse of their rank.<sup>462</sup> MMA promoters rely on high-profile, highly-ranked Fighters at the Top of the Card to draw audiences to Live MMA Events,<sup>463</sup> and Fighter rankings such as the *USA Today/MMA Junkie* rankings are published on fan websites and updated regularly.<sup>464</sup> Rank-based weights account for the fact that

459. Singer Report ¶128.

460. *Id.* ¶¶128-129, 169.

461. *Id.* ¶182, n. 453.

462. In other words, the Fighter ranked first in his or her weight class receives twice the weight of the second-ranked Fighter; the fighter ranked third receives one third the weight of the first-ranked fighter, and so on. *Id.* ¶182, n. 453.

463. *Id.* ¶20; *see also id.* Part I.A.

464. *See* <http://mmajunkie.com/category/mma-rankings> (generally showing biweekly updates); *see also* <http://www.fightmatrix.com/faq/> ("We usually update every Sunday or Monday.").

the higher-ranked a Fighter is, the more valuable he or she is to a promotion, and thus the more economically significant it is when Zuffa locks him or her up to an exclusive contract. Dr. Topel claims that this weighting method is arbitrary.<sup>465</sup> Dr. Topel bases this claim on: (1) a single example from a single bout;<sup>466</sup> and (2) on the fact that, during the Class Period, approximately 10 percent of bouts matched a top-ranked Fighter against the second-ranked Fighter in that division.<sup>467</sup> Dr. Topel is wrong: Neither (1) nor (2) invalidate rank-based weights. To the contrary, the data demonstrate that Fighter rankings, far from being arbitrary, are reliable indicators of Fighters' revenue-generating ability.

130. With respect to (1), Dr. Topel points to a single bout between top-ranked Amanda Nunes and fifth-ranked Ronda Rousey. Because Rousey received more compensation than Nunes, Dr. Topel concludes, from this single example, that rank-based weights are inappropriate.<sup>468</sup> That is incorrect. A comprehensive analysis of the data confirms that both Event Revenue and Fighter compensation are related to Fighter rank in a manner consistent with the inverse rank-weights used in my impact regressions.<sup>469</sup> I estimated a regression that used inverse rank of top-ranked Fighters

465. Topel Report ¶230.

466. *Id.* ¶229.

467. *Id.* ¶230. Dr. Topel claims that “[d]uring the Class Period, 90 percent of Zuffa’s events have featured an athlete at the top of the card...who was not ranked first or second in their respective division.” *Id.* Put differently, approximately 10 percent of bouts matched a top-ranked Fighter against the second-ranked Fighter. However, in 43 percent of these bouts, at least one of the Fighters at the top of the card was ranked first or second. And in 63 percent of these bouts, at least one of the Fighters at the top of the card was ranked in the top five of his or her division. More broadly, my initial report explains that Zuffa relies heavily on Headliners (Fighters ranked within the top 15 of their weight classes) to fill the Top of the Card. For example, in 129 of the 159 UFC PPV events from 2005 to May 2017, both of the Fighters at the Top of the Card were Headliners. At least one of the Fighters at the Top of the Card was a Headliner in 158 of these 159 events. See Singer Report ¶113.

468. Topel Report ¶229.

469. Dr. Topel admitted in his deposition that rank is a predictor of Fighter's revenue-generating ability. Topel Dep. at 241:4-16 (discussing WME-ZUFFA-00001150) (“Q. So one thing that WME would want to know before it invests \$4 billion in Zuffa is that Zuffa has its top-ranked fighters under long-term exclusive contracts, rights? A. Yeah. You want to know you’re not going to lose them in the short run. Q. Why is that? Why would you want to know that? A. Because that’s the human capital that’s going to produce revenue for you over the short run and the champions are more valuable than the guys ranked 11 to 15. And if we went down to the people ranked 50, they’d be less valuable still.”). Dr. Topel admitted that, on average, consumers are willing to pay more to see matches between

to explain variation in the average Event Revenue earned in Live MMA Events. That regression yielded a positive and highly statistically significant relationship, with an *R*-squared of 93.2 percent—meaning that my inverse rank weighting explains 93.2 percent of the variation in average Event Revenue. Similarly, the inverse of Fighter rank explains 92.5 percent of the variation in average Fighter compensation. Thus, a systematic statistical analysis—as opposed to Dr. Topel’s single cherry-picked data point—confirms that Fighter rank is a reliable indicator of Fighters’ revenue-generating ability and compensation.

131. The relationship between Fighter rankings and event revenue has been recognized in published work. In a 2015 article published in the *Journal of Business and Economics*, Professors McGowan and Mahon estimate an econometric model analyzing the determinants of PPV buy rates for UFC events.<sup>470</sup> When discussing the ways in which their empirical model could be improved upon in future work, the authors note that “[s]everal omitted variables exist that are ideally incorporated into the model, including the number of top 5 ranked fighters on the card....”<sup>471</sup>

132. With respect to (2), Dr. Topel observes that “[d]uring the Class Period, 90 percent of Zuffa’s events have featured an athlete at the top of the card...who was not ranked first or second in their respective division.”<sup>472</sup> (Put differently, approximately 10 percent of bouts matched a top-ranked Fighter against the second-ranked Fighter). It is unclear why Dr. Topel believes that this statistic invalidates my rank-based weights, which (as explained above) are reliable predictors of Event Revenue and Fighter compensation. My rank-based weighting method does not assume or

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highly ranked fighters. *Id.* at 432:10-17. He also admitted that, on average, higher ranked fighters generate more revenues when they fight than lower ranked fighters. *Id.* at 432:18-24.

470. McGowan & Mahon (2015).

471. *Id.* at 1047.

472. Topel Report ¶230.

predict that first-ranked and second-ranked Fighters should always appear at the Top of the Card. That would be the case only if rank were the *only* factor that MMA promoters considered when matching Fighters against one another. In any case, in 43 percent of the bouts during the Class Period, at least one of the Fighters at the top of the card was ranked first or second. And in 63 percent of these bouts, at least one of the Fighters at the top of the card was ranked in the top five of his or her division. More broadly, my initial report explains that Zuffa relies heavily on Headliners (Fighters ranked within the top 15 of their weight classes) to fill the Top of the Card. For example, in 129 of the 159 UFC PPV events from 2005 to May 2017, both of the Fighters at the Top of the Card were Headliners. *And at least one of the Fighters at the Top of the Card was a Headliner in 158 of these 159 events.*<sup>473</sup>

## 2. Dr. Topel's Critiques of Revenue-Based Weights Are Incorrect

133. As an alternative to rank-based weights, I also used weights calculated from Fighters' associated promoters' PPV and gate revenues per Fighter.<sup>474</sup> Dr. Topel claims that my revenue-based weights "do not accurately reflect differences in athletes' ability or marketability."<sup>475</sup> Dr. Topel offers three examples to support its claim. In the first example, Dr. Topel claims that my calculations assume that the "very act of being associated with Zuffa"<sup>476</sup> means that an individual Fighter "is 17 times more capable than other athletes of significantly higher rank."<sup>477</sup> In the second example, Dr. Topel claims that my calculations assume that an individual Fighter's "impact on 'foreclosure' increased by a factor of nearly 14 in just five months,

473. Singer Report ¶113.

474. *Id.* ¶¶128-129, 169. My initial report explained that this approach is conservative because revenue data are available only for (relatively) large non-Zuffa MMA promotions such as Bellator and Strikeforce, so that Fighters from smaller promotions (which lack such data) receive the same weight as if they were affiliated with a larger promotion. *Id.* ¶128, n. 350.

475. Topel Report ¶220.

476. *Id.* ¶221.

477. *Id.*

simply because [he] joined Zuffa.”<sup>478</sup> In the third example, Dr. Topel claims that my calculations imply that an individual Fighter’s ability “decreased by 94 percent over a one-month period, merely because he left Zuffa, despite an increase in his rank.”<sup>479</sup>

134. These examples reflect a distortion of my method and thus have no relevance. Dr. Topel is wrongly assuming that my revenue weights must be somehow tailored to individual Fighters. As explained in my initial report, my revenue weights are specific to MMA promoters, not to individual Fighters: “Fighters in the Relevant Input Market were weighted by their *associated promoters’* PPV and gate revenues per Fighter, to reflect differences in the *average* quality of Fighters across *different MMA promoters.*”<sup>480</sup> For purposes of calculating Zuffa’s foreclosure share, the relative weightings of individual Fighters are mathematically irrelevant; what matters is how Zuffa fighters are *collectively* weighted relative to non-Zuffa Fighters.

135. To see this, assume that the average PPV and gate revenue per Zuffa Fighter is \$100, and that the average PPV and gate revenue per non-Zuffa Fighter is \$50. Suppose further that there are a total of 20 Zuffa Fighters, all of which are subject to long-term exclusive contracts, and that there are a total of ten non-Zuffa Fighters. Under this hypothetical, Zuffa’s revenue-weighted foreclosure share is equal to  $\$100 * 20 / [\$100 * 20 + \$50 * 10] = 0.80$ . This calculation weights all Zuffa fighters equally, based on the average across all Zuffa Fighters. But what if some Zuffa fighters are worth more than others? For example, suppose that half of Zuffa fighters have average PPV and gate revenues of \$150 per Fighter, while the other half have average PPV and gate revenues of just \$50 per Fighter. In principle, one could weight half of Zuffa’s fighters more and the other half less, but mathematically it would make no difference—the percentage of the

478. *Id.* ¶222.

479. *Id.* ¶223.

480. Singer Report ¶128 (emphasis added).

overall market foreclosed by Zuffa would be the same. To see this, note that Zuffa's foreclosure share if the two groups of Zuffa Fighters are weighted separately would be  $[\$150*10 + \$50*10]/[\$150*10 + \$50*10 + \$50*10] = 0.80$ . This is mathematically equivalent to the prior calculation. Reshuffling Zuffa's revenue weights to account for differences in individual Fighters' "ability or marketability"<sup>481</sup> has no effect on Zuffa's foreclosure share. Indeed, my revenue weights are agnostic as to these individual differences because all that matters for my foreclosure calculation is the share of the total market foreclosed by Zuffa, not how much any individual Fighter contributes to that foreclosure.

136. Dr. Topel also claims that my revenue-based weights "do not account for differences in promoters' revenues that are attributable to factors unrelated to athletes."<sup>482</sup> According to Dr. Topel,

For an athlete of fixed talent, a promoter that invests more in marketing or is better at marketing than other promoters will have a higher return, as measured by event revenue. Then differences in event revenue across promoters are determined by differences in promoters' investments and business acumen.<sup>483</sup>

Dr. Topel fails to explain how differences in event revenue across different MMA promoters could be the result of factors completely unrelated to Fighters. If, as Dr. Topel claims, Zuffa's investments make its Fighters "more effective revenue-generators,"<sup>484</sup> then, by definition, Zuffa's investments also increase Fighters' MRP, as Dr. Topel admitted.<sup>485</sup> But this observation hardly means that the resulting increase in Event Revenue is unrelated to Fighters. It therefore remains

481. Topel Report ¶220.

482. *Id.* ¶224.

483. *Id.*

484. *Id.* ¶311.

485. Topel Dep. at 24:20-25:9 ("Q. Okay. So if what Zuffa does is . . . makes its fighters more effective revenue generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q. And is it your opinion that Zuffa is particularly good at causing its fighters to be more effective revenue generators? A. I think that's Zuffa's position and I think that's what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes.").

appropriate to use revenue weights to account for differences in the quality—specifically, the revenue-generating ability—of Fighters across different promotions. If differences in promoters' revenue weights were the result of procompetitive conduct, as Dr. Topel claims, then my impact regressions would not have found that the Challenged Conduct reduced the share of Event Revenue accruing to Zuffa's Fighters, because an increase in Zuffa's foreclosure share would not reflect the exercise of monopsony power. Further, if Dr. Topel's claims were correct, my regressions would not continue to show impact and damages when revenue weights are not used to calculate Zuffa's foreclosure share. But my impact regressions are robust to using revenue-based weights, rank-based weights, or even unweighted Fighter counts.<sup>486</sup>

137. Although he does not dispute my definition of the Relevant Output Market, or my conclusion that Zuffa has a dominant share in that market, Dr. Topel does claim, without citation to any authority, that my “revenue-weighted input shares imply that firms with significant market power in the output market also have a large share of the input market,”<sup>487</sup> and that this conclusion is “not accepted by the economic literature.”<sup>488</sup> This is a straw-man critique: My initial report does not claim that *every* firm with significant market power necessarily enjoys large shares in the markets where the firm purchases its inputs. For example, Zuffa has a dominant share of the Relevant Output Market, and also purchases office supplies as inputs. But that does not imply that Zuffa enjoys monopsony power in the market for office supplies: Zuffa’s dominance in the Relevant Output Market does not confer monopsony power in the market for paperclips. In contrast, the source of Zuffa’s dominance in the Relevant Output Market—its unique access to a broad stable of high-quality MMA Fighters, which is essential to staging successful Live MMA

486. Singer Report ¶182, n. 453.

487. Topel Report ¶227.

488. *Id.*

Events<sup>489</sup>—does imply that Zuffa also enjoys dominant shares in the Relevant Input Markets and Submarket. To illustrate, an MMA promoter that is a pure monopolist in the market for promoting MMA events is, by definition, a monopsonist in the market for Fighters seeking to be paid to appear in MMA events: If there is only a single dominant MMA promoter, then there is only one place for an MMA fighter to work. In his deposition, Dr. Topel admitted that a monopoly provider of MMA promotions would also be a monopsonist in the input market for MMA Fighters.<sup>490</sup> Accordingly, to the extent that by using revenue weighting in my foreclosure analysis I am, in part, measuring the degree to which Zuffa’s share of MMA Event Revenue (relative to the Event Revenue accruing to other MMA promotions) is growing over time, it is still an effective means of judging how Zuffa’s growing share of all MMA Event Revenue (and thus growing monopoly power in the output market) has led to reduced Fighter compensation as a share of Zuffa’s Event Revenue.

#### **G. Dr. Topel’s Claim That My Impact Regression Results Are Driven By “Mechanical” Relationships Is Incorrect**

138. Dr. Topel concedes that, as Zuffa’s foreclosure share increased, the share of Event Revenue that Zuffa paid to its Fighters decreased.<sup>491</sup> My impact regressions demonstrate that this empirical relationship holds even after controlling for a host of additional factors.<sup>492</sup> In an attempt

489. Singer Report ¶¶156-166.

490. Topel Dep. at 464:2-14.

491. Topel Report ¶27 (stating that Zuffa’s “share of MMA fighters under contract rose while compensation as a share of event revenue declined”). *See also* Topel Dep. at 50:6-51:2 (“Q. So would you agree that in general the share of UFC event revenues going to fighters did, in fact decline over time, say, from 2009 to 2016 even as fighter compensation measured in dollars per fight increased? A. I’m not sure it declined in every year but I think that – I think the evidence is that fighter compensation increased at a different rate, a slightly lower rate – or somewhat lower rate than the increase in revenues so that the ratio would be lower … The ratio of fighter compensation to total event revenue in which they fight was on average lower as those revenues increased.”). Dr. Topel also admitted that Fighters’ share of revenue decreased after Strikeforce was purchased. *Id.* at 250:11-251:7 (discussing ZFL-1484034-37). Dr. Topel also admitted that Fighter share of revenue decreased between 2007 and 2008 after Zuffa purchased WFA, WEC, and Pride. *Id.* at 249:25-250:3; 252:1-16 (discussing ZFL-1484034-37).

492. Singer Report ¶¶180-187.

to explain away this result, Dr. Topel claims that the foreclosure and compensation metrics used in my impact regression “mechanically generate ‘evidence’ of anticompetitive impact[.]”<sup>493</sup> Dr. Topel is wrong. As explained below, Dr. Topel identifies two sources for this purported “mechanical” relationship. The first is economic, and relies on an unpublished, non-peer-reviewed economic model that incorporates extreme and inapplicable assumptions. The second is mathematical; it rests on a misunderstanding of the revenue weights used in some of my foreclosure calculations.

**1. Dr. Topel’s Ad-Hoc Economic Model Fails to Prove a “Mechanical Negative Correlation Between Foreclosure and Compensation”**

139. As proof for his claim that there is a “mechanical” negative relationship between Fighter Share and Zuffa’s foreclosure share, and that this relationship is merely “an implication of successful competition on the merits by Zuffa,”<sup>494</sup> Dr. Topel offers an inapplicable, ad-hoc economic model.<sup>495</sup> Dr. Topel makes no attempt to fit his model to any real-world data or provide any other evidence of its empirical relevance to MMA generally or this case specifically. Therefore, Dr. Topel’s model is simply a set of assumptions divorced from reality. Based on his model, Dr. Topel concludes that “Dr. Singer’s finding of a negative relationship between compensation as a share of revenue...and the share of MMA athletes under contract with Zuffa...is exactly what would occur if Zuffa’s success is the result of competing on the merits[.]”<sup>496</sup> Dr. Topel is wrong.

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493. Topel Report ¶27. Dr. Topel does not cite to any authority explaining what a “mechanical” relationship is, or the circumstances under which it is a valid econometric critique.

494. *Id.* ¶137.

495. *Id.* ¶¶308-315 (Appendix A).

496. *Id.* ¶315.

140. Dr. Topel's economic model is predicated on extreme and inapplicable assumptions, and generates nonsensical results. *First*, Dr. Topel's economic model unrealistically assumes an effectively limitless supply of perfectly interchangeable Fighters: In economic terms, he assumes that Zuffa faces a "horizontal," or "perfectly elastic" labor supply curve.<sup>497</sup> Thus, according to Dr. Topel's model, Zuffa can hire as many perfectly interchangeable Fighters as it requires at a flat rate, as if it were purchasing a homogenous commodity, such as paperclips: A perfectly elastic supply curve means that Zuffa has no control whatsoever over the market wage for Fighters; it is equivalent to assuming that Zuffa has *no monopsony power whatsoever*.<sup>498</sup> The assumption of a horizontal supply curve is inapplicable to MMA Fighters, which are not commodities, but highly trained athletes, with widely varying attributes, skill levels, and revenue-generating potential.<sup>499</sup>

497. *Id.* ¶312.

498. See, e.g., THOMAS HYCLAK, GERAINT JOHNES, AND ROBERT THORNTON, FUNDAMENTALS OF LABOR ECONOMICS 211 (Cengage 2<sup>nd</sup> ed. 2012) ("In a competitive labor market, each employer employs a small percentage of the total number of workers in that market. Individual employers are too small to have any effect on the wage rate, and every employer can hire as much labor as he or she desires without having to pay a higher wage. The supply of labor facing each employer in such a labor market is horizontal, or perfectly elastic. Certainly this description does not characterize all labor markets. In some labor markets, one employer employs a relatively large proportion of that market's total labor force, or maybe the labor market is dominated by more than one employer, but still a small number. In such cases employers may have some control over the wage they must pay to attract workers, in effect facing an upward-sloping supply of labor function, which is unlike that faced by competitive employers. These are monopsony employers... we are talking about a market with sufficiently few employers so that each of them has some control over the market wage and does not, therefore, face a perfectly elastic labor supply schedule."). See also Oyer Dep. at 62:12-64:21, 66:18-25.

499. Dr. Oyer admitted in his deposition that the supply curve of labor faced by Zuffa is not flat because Fighters are not perfect substitutes. Oyer Dep. at 83:5-15. See also Blair Dep. at 18:7-14 ("Is it fair to say that the unique set of skills that athletes have or their fame plays an important role in the revenues generated by sports organizations? A. Yeah, sure. I mean ... because of fan appeal .... The fans are more willing to pay to watch some of these so-called superstars."); Topel Dep. at 450:8-11 ("Q. All right. Would you agree with me that not all fighters are exact substitutes for each other? A. I'll agree with that."); see also *id.* at 432:10-24 ("Q. All things equal, consumers will be willing to pay more to see highly-ranked opponents fight than lower-ranked opponents fight; is that fair? A. In every instance, no, but on average, probably yes. Q. Higher ranked fighters, all things equal, generate more revenues when they fight than lower-ranked fighters, correct? ... A. Not always, but on average that's probably true."); *id.* at 450:12-19 ("Q. Would you agree with me that some fighters are more important to an MMA promotion than others? ... A. Yes. Q. Some [fighters] generate more revenues when they fight than others; is that right? A. Yes.").)

141. *Second*, Dr. Topel's model engineers the result that Fighter compensation will never increase, regardless of how much additional revenue Zuffa earns from Fighters. This result is another consequence of Dr. Topel's patently unrealistic horizontal supply curve: Under Dr. Topel's model, as the UFC becomes more popular, its demand for Fighters increases. But no matter how popular the UFC becomes, there is no upward pressure on Fighter compensation. Again, Fighters are like paperclips: Zuffa can purchase as many paperclips as it needs at the market price. No matter how popular the UFC becomes, no matter how much Zuffa's operations expand, and no matter how much Zuffa's office-supply purchases increase, it will not cause the price of a paperclip to rise at all. By the same logic, under Dr. Topel's model, Fighters never get a raise, no matter how much revenue they generate for Zuffa. But—according to Dr. Topel—this would not reflect the exercise of monopsony power, and instead is indicative of competition.<sup>500</sup>

142. *Third*, Dr. Topel's economic model cannot explain why Zuffa would enter into long-term exclusive contracts with Fighters. If Fighters really were a uniform commodity, as Dr. Topel's model assumes, Zuffa would have no need for long-term contracts of any kind, because any Fighter that left Zuffa could immediately be replaced by another identical Fighter at exactly the same compensation as the previous Fighter. Thus, Zuffa's own contracting practices invalidate Dr. Topel's model.

143. *Fourth*, Dr. Topel's economic model is refuted by the results of his own regression model, by his own admissions, and by Zuffa's own statements. When Dr. Topel includes Event Revenue as an explanatory variable; it is invariably positive and highly statistically significant,

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500. Topel Report Appendix A.

indicating that Fighters' compensation rises and falls with Event Revenue.<sup>501</sup> This empirical result further refutes Dr. Topel's unrealistic theoretical model, which predicts that compensation per Fighter should remain fixed, and should not correlate with Event Revenue. Indeed, Dr. Topel opines in his report that Fighter compensation is related to Zuffa's revenue,<sup>502</sup> and Dr. Topel admitted the same thing in his deposition.<sup>503</sup> Zuffa's own statements also confirm that Fighters are compensated based on their revenue-generating ability.<sup>504</sup>

## **2. Dr. Topel Fails to Prove that my Revenue-Based Weights Introduce a “Mechanical Negative Correlation Between Foreclosure and Compensation”**

144. Dr. Topel also claims incorrectly that using revenue weights introduces a “mechanical negative correlation” into my impact regressions.<sup>505</sup> According to Dr. Topel, as Zuffa's revenue increases, this will (1) cause Fighter compensation as a share of revenue to decline; while, (2) simultaneously causing Zuffa's revenue-weighted foreclosure share to increase.<sup>506</sup> Both (1) and (2) are incorrect.

145. With respect to (1), an increase in Zuffa's Event Revenue indicates that Fighter MRP has increased. Holding other factors constant (as my impact regressions do), an increase in

501. Topel Report Exhibit 13, columns (4) – (6); *see also id.* ¶148 (“event revenue has a statistically significant positive effect on athlete pay.”). Dr. Topel admitted that there is a statistically significant relationship between Event Revenue and fighter compensation. *See* Topel Dep. at 39:19-23 (“Q. You, in fact, found in this case that there's a statistically significant relationship between event revenues and fighter compensation, correct? A. Yes.”).

502. Topel Report ¶200 (“Lower [UFC] revenues would likely lead to lower athlete compensation.”).

503. *See* Topel Dep. at 39:10-23, 201:19-202:11, 202:21-203:3, 420:10-19.

504. *See, e.g.* Damon Martin, *Dana White defends fighter pay: ‘In this sport you eat what you kill’*, FOX Sports, November 15, 2016, at <https://www.foxsports.com/ufc/story/dana-white-defends-fighter-pay-in-this-sport-you-eat-what-you-kill-092616> (“When you fight on pay-per-view and you're a star — basically in this sport you eat what you kill. So the guys that bring in the majority of the revenue, make the majority of the revenue.”). *See also* Mike Bohn, UFC President Dana White: If you're not a 'big pay-per-view star, shut up and fight', MMAJunkie, March 4, 2017, at <http://mmajunkie.com/2017/03/ufc-president-dana-white-if-youre-not-a-big-pay-per-view-star-shut-up-and-fight> (Dana White says: “Guys are talking about money fights, and I'm like, 'You're not a money fight... OK? You're going to make whatever you're going to make, and if you're a good champion, your fight sells, and you're going to do pay-per-views and be part of the pay-per-view. If you're not that big pay-per-view star, shut up and fight.”).

505. Topel Report ¶¶163-166; *id.* at Exhibits 15-16.

506. *Id.*

Zuffa's Event Revenue should not cause Fighter compensation as a share of revenue to decline—unless Zuffa is exploiting its monopsony power to pay Fighters a smaller share of their MRP.

146. With respect to (2), Zuffa's revenue-weighted foreclosure share will increase only if Zuffa's average gate and PPV revenue per Fighter increases *relative to that of other MMA promoters*, indicating that Fighters under contract with Zuffa have become more valuable, relative to non-Zuffa Fighters. Again, the impact regression will measure a correlation between this increase in Zuffa's foreclosure share and a decrease in the Fighter Share *if and only if*, after controlling for all other factors in the regression, Zuffa pays Fighters a lower share of Event Revenue when Event Revenue increases—that is, only if the data indicate that Zuffa is exercising monopsony power by paying Fighters a lower fraction of their MRP. In his deposition, Dr. Topel reversed himself and effectively admitted that there was not a mechanical relationship between my revenue-weighted foreclosure share and wage share.<sup>507</sup>

147. It is straightforward to demonstrate that my impact regressions do not rely on a “mechanical negative correlation” generated by the revenue weighting. For this rebuttal, and for purposes of refuting Dr. Topel’s point specifically, I generated alternative versions of the revenue weights that (unlike in my initial report) do *not* vary over time, and are instead calculated from Zuffa’s overall average gate and PPV revenue per Fighter increases relative to that of other promoters. Because these revenue weights are fixed over time, they cannot generate any correlation (“mechanical” or otherwise) between Zuffa’s foreclosure share and Zuffa’s Event Revenue. When fixed revenue weights are used, the impact regressions continue to show a

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507. Topel Dep. at 462:6-12 (acknowledging that an increase in Zuffa revenues do not automatically cause Zuffa’s foreclosure share to increase).

negative and economically and statistically significant relationship between Zuffa's foreclosure share and the Fighter Share of Event Revenue.<sup>508</sup>

148. In addition to being incorrect, Dr. Topel's claim that using revenue weights introduces a "mechanical negative correlation"<sup>509</sup> into my impact regressions is irrelevant. As I explained in my initial report, to demonstrate the robustness of my impact regressions, I confirmed that my impact regressions continue to find a negative and statistically and economically significant relationship between Zuffa's foreclosure share and the Fighter Share even when Zuffa's foreclosure share is calculated using an unweighted count of Fighters.<sup>510</sup> Therefore, my impact regressions do not hinge on the use of revenue weights to calculate Zuffa's foreclosure share. Accordingly, Professor Topel's claim that "[a]bsent revenue-weighting, Dr. Singer can neither argue that Class members were impacted by the Challenged Conduct, nor can he argue that Class members suffered injury as a result of the conduct"<sup>511</sup> is simply wrong.

### **III. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY CLASSWIDE PROOFS OF COMMON IMPACT ON THE BOUT AND IDENTITY CLASSES**

149. My initial report shows that common impact can be demonstrated for both the Bout Class<sup>512</sup> and the Identity Class<sup>513</sup>—with classwide evidence and analyses. As explained below, Zuffa's economists' critiques of my classwide proofs of impact are without merit.

508. See Appendix Table A4.

509. Topel Report ¶¶163-166.

510. Singer Report ¶182, n. 435. My regression results are also robust to calculating Zuffa's foreclosure share by weighting Fighters by the inverse of their rank. *Id.*

511. Topel Report ¶225.

512. Singer Report Part IV.

513. *Id.* Part V.

**A. Zuffa's Economists Fail to Rebut My Classwide Econometric Proof That the Vast Majority of Bout Class Members Suffered Impact**

150. My initial report used standard econometric methods common to the class, which have been accepted in prior antitrust litigation,<sup>514</sup> to demonstrate directly that the vast majority of Bout Class members received lower compensation than they would have in the but-for world due to the Challenged Conduct.<sup>515</sup> Specifically, I use my impact regressions—which are common to the Bout Class as a whole—to compute the share of Event Revenue that *each individual Fighter* would have received in the but-for world. I then compare this computation for each Fighter to the share of Event Revenue that *each individual Fighter received in the actual world*.<sup>516</sup> If the former exceeds the latter, the Fighter is deemed to have suffered antitrust impact. This econometric proof of impact demonstrated that, depending upon which version of my model is implemented, approximately 98.5 to 99.6 percent of Bout Class members suffered antitrust impact.<sup>517</sup>

151. Dr. Topel claims incorrectly that my regression models are “not designed to measure whether each Bout class member suffered damages.”<sup>518</sup> But this is precisely what my second method for proving antitrust *impact* does, as explained immediately above. Dr. Topel appears to be confusing my calculations of aggregate damages—which, as Dr. Topel suggests, “calculate the average underpayment [to Fighters]...and appl[y] that underpayment to an estimate of total event revenue during the Class Period”<sup>519</sup>—with my econometric method for proving

514. See, e.g., *In re Air Cargo Shipping Servs. Antitrust Litig.*, No. 06-MD-1775 JG VVP, 2014 WL 7882100 (E.D.N.Y. Oct. 15, 2014).

515. Singer Report ¶¶230-231.

516. *Id.* ¶230.

517. *Id.* Table 8 (corrected figures reported in Singer Errata).

518. Topel Report ¶279.

519. *Id.* ¶279; see also Singer Report Part VI (“Aggregate Damages”).

antitrust impact, which relies on individual, class-member specific predictions from my regression model.<sup>520</sup>

152. Dr. Topel simply fails to rebut this standard econometric method for proving common impact. Instead, he performs nearly identical calculations using my model, but assumes that Zuffa's foreclosure would have fallen only to 30 percent in the but-for world.<sup>521</sup> My calculations for measuring common impact in my initial report assume that Zuffa's foreclosure would have fallen to either 20 percent or zero percent in the but-for world.<sup>522</sup> Nonetheless, Dr. Topel effectively confirms my common impact conclusion. According to his own calculations, virtually all Bout Class members suffered antitrust impact. Tables 2 and 3 below display the percentage and number of Bout Class members that suffered impact according to Dr. Topel's own calculations, as well as my own. These calculations further confirm that my conclusions regarding classwide impact are not sensitive to varying assumptions regarding Zuffa's foreclosure share in the but-for world. Finally, because I can identify exactly which Fighters were uninjured according to this econometric method, these Fighters could easily be removed from the Bout Class (and/or from any proposed allocation of damages) should the Court deem it necessary.

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520. Singer Report ¶¶230-231.

521. Topel Report ¶280, n. 405.

522. Singer Report ¶231 (Table 8). Because Dr. Topel assumes a higher foreclosure share in the but-for world, he calculates that Conor McGregor was not impacted by the Challenged Conduct, while Ronda Rousey was impacted. See Topel Report ¶281. But this demonstrates that my classwide econometric method takes individualized factors into account—if all it did was apply an average effect to all Fighters, then all Fighters would be impacted to exactly the same degree. In any case, even under Dr. Topel's assumptions, Conor McGregor suffered antitrust impact in 5 events during the Class Period, and thus suffered impact if impact is understood to mean being undercompensated due to the Challenged Conduct in at least one event. If the but-for foreclosure share is 20 percent, then the impact regressions show that Conor McGregor also suffered antitrust impact on net (that is, the aggregate share of Event Revenue received by Conor McGregor across all events in the regression database during the Class Period was less than the aggregate share that he would have received in the absence of the Challenged Conduct).

**TABLE 2: CLASSWIDE IMPACT IMPLIED BY SINGER AND TOPEL CALCULATIONS  
BOUT CLASS MEMBERS INJURED IN AT LEAST ONE LIVE MMA EVENT**

<b>But-For Foreclosure Share</b>	<b>Total Fighters</b>	<b>Injured</b>	<b>Uninjured</b>	<b>Percent Injured</b>
<b>Singer Calculations</b>				
0%	1,056	1,052	4	99.6%
20%	1,056	1,047	9	99.1%
<b>Topel Calculations</b>				
30%	1,056	1,046	10	99.1%

*Note:* Dr. Topel's original calculations produced with his work papers were incorrect, although the errors are not material. Specifically, Dr. Topel relied upon a Fighter name field when counting Fighters, rather than a unique Fighter identification number. In addition, Dr. Topel counted only UFC Fighters, as opposed to all Zuffa Fighters. If those errors are not corrected, Dr. Topel's calculations imply that 99.2 percent of the Bout Class suffered injury in at least one Live MMA Event.

**TABLE 3: CLASSWIDE IMPACT IMPLIED BY SINGER AND TOPEL CALCULATIONS  
BOUT CLASS MEMBERS INJURED ON NET**

<b>But-For Foreclosure Share</b>	<b>Total Fighters</b>	<b>Injured</b>	<b>Uninjured</b>	<b>Percent Injured</b>
<b>Singer Calculations</b>				
0%	1,056	1,045	11	99.0%
20%	1,056	1,042	14	98.7%
<b>Topel Calculations</b>				
30%	1,056	1,040	16	98.5%

*Note:* Dr. Topel's original calculations produced with his work papers were incorrect, although the errors are not material. Specifically, Dr. Topel relied upon a Fighter name field when counting up Fighters, rather than a unique Fighter identification number. In addition, Dr. Topel counted only UFC Fighters, as opposed to all Zuffa Fighters. If those errors are not corrected, Dr. Topel's calculations imply that 98.6 percent of the Bout Class suffered injury on net.

## B. **Zuffa's Economists' Critiques of My Compensation Structure Analyses of Common Impact Are Without Merit**

153. In addition to the econometric proof of impact, my initial report also showed that common impact can be demonstrated through proof of a (1) a generalized effect on compensation; plus (2) the existence of a compensation structure.<sup>523</sup> This is a standard, two-pronged, class-wide approach to proving common impact that has been accepted in prior antitrust litigation. To satisfy the first prong, I demonstrated that classwide evidence is capable of showing that the Challenged Conduct had a generally suppressive effect on compensation Zuffa paid to members of the Bout

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523. Singer Report Parts IV.A-IV.B; *id.* at Part V.

Class. This evidence includes the results of my impact regressions, which show that Zuffa's foreclosure suppressed Fighter compensation, as well as other evidence that the Challenged Conduct suppressed Fighter compensation.<sup>524</sup> To satisfy the second prong, I demonstrated that there is class-wide evidence of a mechanism that would transmit the artificially reduced compensation (found by the first prong) broadly across the Class. This includes documentary evidence that Zuffa utilizes formulaic pay schedules based on common elements and informed by the concept of "internal equity,"<sup>525</sup> as well as econometric evidence that common factors explain a larger fraction of variation in Fighter compensation, and that gains (or losses) in compensation are broadly shared across Fighters.<sup>526</sup> As explained below, Zuffa's economists' critiques of my proof of impact via a common compensation structure are without merit. Indeed, Dr. Topel misunderstands the meaning of a compensation structure, and actually presents evidence consistent with a rigid compensation structure.

#### **1. Dr. Topel Misunderstands the Meaning of Compensation Structure in the Class Certification Context**

154. My initial report explained that my compensation structure methodology had been accepted in prior antitrust litigation.<sup>527</sup> Dr. Topel dismisses the entire methodology as "nonsense,"<sup>528</sup> claiming "[t]he fact that my pay as an economist tends to move with the average pay of other economists does not imply the existence of a 'pricing structure' that determines the pay of economists."<sup>529</sup> Dr. Topel appears not to understand the meaning of a compensation

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524. *Id.* Parts III.D.1-2; *see also* Part I.B.1, *supra*.

525. Singer Report Part IV.B.1.

526. *Id.* Part IV.B.2.

527. *Id.* *See also Order Granting Plaintiffs' Supplemental Motion for Class Certification, High-Tech Employee Antitrust Litig.*, No. 11-CV-02509 (N.D. Cal. Oct. 24, 2013), at 60-61; Caves & Singer (2015) at 5.

528. Topel Report ¶266.

529. *Id.*

structure as it applies in the class certification context.<sup>530</sup> As explained in my initial report, a compensation structure is simply “a mechanism that would transmit the artificially reduced compensation...broadly across the Class.”<sup>531</sup> To use Dr. Topel’s analogy, to the extent that the compensation of individual economists moves together with the average pay of other economists, an exercise of monopsony power that artificially suppressed economists’ compensation on average would be broadly transmitted across a hypothetical class of economists. In his deposition, Dr. Topel agreed that he would expect his pay as a consulting economist to move together with the pay of other consulting economists, because their compensation, while not identical, is determined by common factors.<sup>532</sup> *That is indeed evidence of a compensation structure.*

## **2. Zuffa’s Economists’ Critiques of the Compensation Structure Evidence Are Without Merit**

155. My initial report provides documentary and testimonial evidence consistent with a compensation structure.<sup>533</sup> Dr. Topel ignores most of this evidence, singling out one document (the “Minimum Fighter Pay”<sup>534</sup> document), and asserting that “the ‘Minimum Pay Document’ is not a real Zuffa contract. Rather, it was simply a forecasting tool used to estimate the effects of

530. See Topel Dep. at 176:23-177:6 (“A. Well, Dr. Singer seems to be referring to a – almost a schedule, a formulaic way of determining the pay of people ...”).

531. Singer Report ¶209.

532. Topel Dep. at 177:24-178:7 (“Q. And let’s talk about your economist example. Is the reason why the compensation of an individual economist . . . would be related to the compensation of average economists that there are similar factors that are at work in the compensation of economists in a market generally. A. There are common market forces.”). See also id. at 178:25-179:21 (“Q. ... You agree that your pay as a consulting economist tends to move generally with the average pay of all consulting economists, right? ... A. ... Economic principles tell[] me that should be true. Q. And thus even though different testimonial economists charge different rates based on various factors like experience and credentials, the pay of consulting economists tends to move together, right? ... A. I believe that would be true. Q. And that’s because there are certain common factors influencing the demand for testimonial economist services, correct? A. Or the supply.”); id. at 182:21-183:4 (“Q. ... Why would you expect that the earnings of individuals working in the same profession or for the same employer to be correlated? A. Well, for the same . . . profession, it’s back to my taco example that the market conditions affecting taco stands are common. So changes in the prices of corn to produce the tortillas and changes in the price of avocados affect all the taco stands.”).

533. Singer Report ¶¶216-226.

534. Topel Report ¶¶261-263; Singer Report ¶¶220-222.

increasing minimum compensation.”<sup>535</sup> My initial report does not claim that the Minimum Fighter Pay document was a Zuffa contract, and recognizes that it was a planning document.<sup>536</sup> But it should be obvious that the Minimum Fighter Pay document would have been useful as a forecasting tool only if it were based on Zuffa’s actual compensation practices. Dr. Topel provides no evidence to the contrary.<sup>537</sup> In his deposition, Dr. Topel admitted that Zuffa used a “pay scale,” such that an increase in minimum pay would increase the pay of fighters paid above the minimum.<sup>538</sup>

156. Dr. Topel claims that my initial report “ignores substantial testimony that Zuffa compensation is primarily driven by individual factors, and not common factors.”<sup>539</sup> The only evidence that Dr. Topel offers to support this charge consists of excerpts from the deposition transcript of Lawrence Epstein.<sup>540</sup> But Mr. Epstein’s testimony does not support Dr. Topel’s claim that Fighter compensation is primarily driven by individual factors. Mr. Epstein’s testimony that

535. Topel Report ¶¶262.

536. Singer Report ¶222.

537. Dr. Topel also concedes that, according to the Minimum Fighter Pay document, “the level of Show compensation was close or equal to \$8,000 or \$10,000 in approximately 50 percent of Zuffa bouts in 2014,” but claims that the Minimum Fighter Pay document is inconsistent with a pricing structure due to “substantial variation in Show compensation for the remaining fifty percent of Zuffa bouts... The question then becomes, what explains this variation in Show compensation across Zuffa bouts? Is the variation driven by common factors...?” Topel Report ¶263. My initial report performed this analysis, and demonstrated that 78 percent of the variation in Fighter compensation could be explained by common factors alone, which supports the existence of a compensation structure. Singer Report ¶227.

538. Topel Dep. 174:4-18. (“Q. Well, you referenced a document in which Zuffa discussed its minimum bout compensation, right? You discuss it in this paragraph, correct? A. That’s my recollection in other words, the minimum pay document, okay, if that’s what you’re talking about, yes. Q. And in this document that you’re discussing in paragraph 263 Zuffa estimated that if it raised its minimum pay it would cause the pay of not just those at the bottom of the pay scale to rise, but even would cause the pay of fighters who were above the minimum to rise, correct? A. I recall that sentence or something to that effect.”); *id.* at 175:3-12 (“Q. Okay. Well, why was, then, raising the minimum pay projected to effect [*sic*] the pay even of those fighters who were being paid above the minimum? A. Because you’re using a pay scale for people of different talents and different levels of effort. So taken individual – we’ll do it within a fight. I guess we can think of it this way. If I raise the minimum show, I have to raise the minimum win to maintain incentives.”).

539. Topel Report ¶264.

540. *Id.* ¶¶264-65.

compensation depends on “many, many factors”<sup>541</sup> such as “notoriety,”<sup>542</sup> “representation,”<sup>543</sup> and “rival promoters’ interest in the athlete”<sup>544</sup> does not disprove the existence of a compensation structure; these are simply examples of factors that could determine where a Fighter falls *within Zuffa’s compensation structure*. Finally, that Fighter compensation may sometimes depend in part on individualized factors does not imply that common factors are irrelevant or that individual factors predominate over common ones; nothing in Mr. Epstein’s testimony contradicts my conclusion that 78 percent of the variation in Fighter compensation can be explained by common factors.<sup>545</sup>

157. Dr. Blair claims that Zuffa Fighter compensation “varies tremendously by athlete.”<sup>546</sup> This claim is both irrelevant and based on a flawed analysis. It is irrelevant because the mere fact that Fighter compensation varies by athlete does not imply that a compensation structure is absent. (By this logic, a compensation structure would be deemed absent if “only” 99 percent of the variation in Fighter compensation could be explained by common factors). Dr. Blair’s analysis is also a misinterpretation of a limited set of data reflecting UFC Fighter compensation in 2013 for all Fighters in their first bout with the UFC.<sup>547</sup> Dr. Blair’s analysis fails to control for the wide range of common factors included in my common factors regression, and therefore cannot be used to refute my finding of a common compensation structure. For example, Dr. Blair’s analysis does not even consider whether the Fighter won his bout, which mechanically doubles a Fighter’s compensation under a standard Zuffa contract. Dr. Blair’s Table 4 includes 30 Fighters who were

541. *Id.* ¶264 (citing Deposition of Ike Lawrence Epstein (December 2, 2016) at 29-32).

542. *Id.*

543. *Id.*

544. *Id.*

545. Singer Report ¶227.

546. Blair Report ¶79.

547. *Id.* Table 4.

compensated \$11,000, and 30 others who earned either \$21,000 or \$22,000. In his deposition, Dr. Blair admitted that it was possible that all 60 of these Fighters were on the same pay scale, given that Fighters who win their bout receive twice the pay of Fighters who lose, but testified that “I don’t believe it’s actually true in this specific case.”<sup>548</sup> Dr. Blair is wrong: All 60 of these Fighters were paid according to a common structure, with only minor variations.<sup>549</sup>

### **3. Dr. Topel’s Critiques of My Compensation Structure Regressions Are Without Merit**

158. In my initial report, I estimated regressions in which the dependent variable was set equal to an individual Fighter’s annual compensation per event, and the independent variable was set equal to either: (1) the average compensation per event paid to all other Fighters in *that* year; or (2) the average compensation per event paid to all other Fighters in the *prior* year.<sup>550</sup> That analysis confirms that individual Fighter compensation per event moves together with the per-event compensation paid to other Fighters in the current year, and also in the prior year. This provides further evidence of a compensation structure and, accordingly, of common impact flowing from generalized compensation suppression.<sup>551</sup>

159. Dr. Topel implements a variation on my compensation structure regressions in which the average per-bout compensation paid to other Fighters in *both* the current year *and* the prior year are included in the *same* regression.<sup>552</sup> In other words, Dr. Topel’s regression model

548. Blair Dep. at 358:1-13.

549. Of these 60 Fighters, all but one had an \$8,000 “show” purse (one had a \$9,000 “show” purse). Half of these 60 Fighters won their bouts, netting an additional \$8,000 in a “win” purse. The 30 Fighters who lost received an additional \$3,000 in “discretionary” pay, for a total of  $\$3,000 + \$8,000 = \$11,000$ . All but one of the 30 Fighters who won received either \$5,000 or \$6,000 in “discretionary” pay, for a total of either  $\$5,000 + \$8,000 + \$8,000 = \$21,000$  or  $\$6,000 + \$8,000 + \$8,000 = \$22,000$ . (The Fighter with a \$9,000 “show” purse received \$4,000 in “discretionary” pay, so her total pay came to  $\$4,000 + \$9,000 + \$9,000 = \$22,000$ ).

550. Singer Report ¶228.

551. *Id.* ¶229.

552. Topel Report ¶¶269-270; *id.* Exhibit 32.

measures (1) the extent to which individual Fighter compensation per event moves together with the per-event compensation paid to other Fighters in the current year—controlling for the per-event compensation paid to other Fighters in the prior year; and (2) the extent to which individual Fighter compensation per event moves together with the per-event compensation paid to other Fighters in the prior year—controlling for the per-event compensation paid to other Fighters in the current year. According to Dr. Topel’s regressions, the effect given by (2) is positive and statistically significant: Any individual Zuffa Fighter’s compensation is positively and significantly related to the average compensation paid to other Zuffa Fighters in the prior year—even after controlling for the average compensation paid to other Zuffa Fighters in the current year.<sup>553</sup> Dr. Topel’s own analysis thus confirms again that changes in Fighter compensation generally are broadly shared across Fighters over time: Dr. Topel’s finding implies that, if other Fighters received a pay increase in the prior year, than an individual Fighter is expected to receive an increase in the current year.

160. According to Dr. Topel’s regressions, the effect given by (1) is not statistically significantly different from zero: When per-event compensation paid to other Fighters in the prior year is held constant, there is no statistically significant relationship between the average per-event compensation of other Fighters in the current year and an individual Fighter’s per-event compensation in that same year.<sup>554</sup> This is unsurprising, and perfectly consistent with a pricing structure. This result simply indicates that it takes time for a change in compensation to be transmitted across Bout Class members. This does not imply that a compensation structure is

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553. *Id.* Exhibit 32, column (3).

554. *Id.*

absent. Thus, Dr. Topel's regressions do not somehow disprove a compensation structure, as he claims.<sup>555</sup>

161. My compensation structure regressions used data from all available time periods, from 2005 through 2016.<sup>556</sup> That analysis demonstrated that, holding other factors constant, an individual Fighter's compensation per bout moves together with the per-bout compensation paid to other Fighters.<sup>557</sup> In other words, my econometric analysis found that the compensation of an individual Fighter moved together with the compensation of other Fighters in the Bout Class. Dr. Topel repeats this analysis, but discards all data prior to 2010 and concludes that "there is no evidence of a common compensation structure during the Class Period."<sup>558</sup> Dr. Topel claims that he is justified in discarding pre-2010 data because, he claims, individual Fighter compensation is correlated with other Fighters' compensation before the Class Period, but not during the Class Period. Dr. Topel is wrong. As he has done in other parts of his analysis in this case,<sup>559</sup> Dr. Topel only arrives at his result by selectively discarding data without any basis in standard econometric principles. Here, without citation to any authority or providing any sound justification, Dr. Topel discards the pre-Class Period data (a total of 825 data points, representing 19 percent of the observations used in this analysis). This was improper. As explained below, when a valid statistical test is used, my original conclusions are reinforced.

162. The valid approach to testing Dr. Topel's hypothesis (that changes in compensation were broadly shared across Fighters *before* the Class Period, but not *during* the Class Period) is not to discard hundreds of data points, as Dr. Topel did, but to test for a "structural break" in the

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555. *Id.* ¶270.

556. Singer Report ¶¶228-229; *id.* Table 7.

557. *Id.*

558. Topel Report ¶268.

559. See Part II.B, *supra*.

relationship between individual Fighter compensation and other Fighters' compensation at the start of the Class Period.<sup>560</sup> If Dr. Topel's hypothesis is correct, then there should be a statistically significant difference between (1) the correlation between individual Fighter compensation and other Fighters' compensation before the Class Period; and (2) the correlation between individual Fighter compensation and other Fighters' compensation during the Class Period. I implemented this test. Under the null hypothesis, the relationship between individual Fighter compensation and the per-bout compensation paid to other Fighters is the same before and after the start of the Class Period. Under the alternative hypothesis, the relationship is not the same. The results of the test indicate that there is insufficient evidence to reject the null hypothesis, indicating that there is no structural break between the two time periods. Therefore, an increase in other Fighters' compensation is indeed associated with a positive and statistically significant increase in an individual Fighters' compensation both before and during the Class Period. This reinforces my prior conclusion that the compensation structure regressions provide evidence that gains and losses in compensation are shared broadly across the Bout Class. It also confirms my finding that there was a generalized suppression of compensation due to the Challenged Conduct would demonstrate impact all or nearly all Class members.

163. As additional support for a compensation structure, my initial report described an analysis I performed showing that a regression that excludes Fighter-specific variables (such as average strikes landed, average takedown attempts, and Fighter fixed effects<sup>561</sup>), and includes only common factors (such as weight class, rank, gender, placement on the card, year, country, and bout

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560. ROBERT PINDYCK & DANIEL RUBINFELD, 117-119 ECONOMETRIC MODELS & ECONOMIC FORECASTS (McGraw-Hill 3<sup>rd</sup> ed. 1991).

561. As explained above, Fighter fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.

venue), explains 78 percent of the variation in the compensation paid to Zuffa Fighters.<sup>562</sup> Dr. Topel claims that this “overstates the fraction of athletes’ compensation that is explained by these common factors.”<sup>563</sup> Dr. Topel’s critique is without merit. Dr. Topel does not challenge the merits of the regression I specified showing that a regression of Fighter compensation on common factors alone explains 78 percent of the variation in Fighter compensation. The 78 percent figure from my initial report is simply the *R*-squared of that regression. My interpretation of the *R*-squared statistic in that regression—which regression Dr. Topel does not challenge—follows from elementary econometric principles: Factors common to all Bout Class members explain 78 percent of the variation in Fighter compensation.<sup>564</sup> This is powerful evidence that Fighter compensation will move together over time in response to common forces, and thus further evidence that any artificial suppression of compensation would be broadly experienced by the Class as a whole.

164. Dr. Topel’s only counter to this analysis is to run an alternative regression that includes the Fighter-specific variables noted above, while excluding the common factors noted above. Dr. Topel’s alternative regression shows that the Fighter-specific variables explain only slightly more of the variation in Fighter compensation (79 percent) than the common factors (78 percent, as noted above). Dr. Topel opines that “it does not make sense for Dr. Singer’s common factors and athlete-specific explanatory variables to simultaneously explain 78 and 79 percent of the variation in Zuffa athletes’ compensation,”<sup>565</sup> and concludes that “Dr. Singer’s methodology does not reliably measure the fraction of athletes’ compensation explained by common factors.”<sup>566</sup> Dr. Topel is wrong. His 79 percent statistic merely reinforces my prior conclusion: He has shown

562. Singer Report ¶227.

563. Topel Report ¶272.

564. Wooldridge at 80-81.

565. Topel Report ¶272.

566. *Id.*

that a regression that explains Fighter compensation purely in terms of common factors has nearly the same explanatory power (78 percent) as a regression that includes individual-specific controls for each Fighter (79 percent). It is not at all surprising that the explanatory power of the Fighter-specific variables overlaps with that of the common factors; this merely indicates that at least some of the Fighter-specific variables are correlated with at least some of the common factors. (Indeed, Fighter fixed effects alone—which control for all Fighter-specific attributes that are fixed over time—explain 49 percent of the variation in Fighter compensation). What is significant is that, if one wanted to predict Fighter compensation, a model that relied exclusively on common factors would have essentially the same predictive power as an alternative model that relied exclusively on Fighter-specific factors. All of this confirms my conclusion that factors common to all Bout Class members explain can explain the vast majority of the variation in Fighter compensation.<sup>567</sup>

#### **4. Dr. Topel Presents Classwide Evidence Consistent with, and Reinforcing the Presence of, a Compensation Structure**

165. Exhibit 17 of Dr. Topel’s expert report presents regressions “measur[ing] changes in Zuffa compensation across years while controlling for changes in the composition of athletes participating in Zuffa bouts.”<sup>568</sup> The results of these regressions—evidence that is common to the Class as a whole—bolster my finding of a compensation structure. They show that Fighter compensation moves together over time, and that these patterns are observed across Fighters of “all levels of rankings.”<sup>569</sup> Dr. Topel further concedes that fighter compensation moved together because fighter compensation is determined by common factors.<sup>570</sup> Finally, Dr. Topel testified that

567. Wooldridge at 80-81.

568. Topel Report ¶¶170-171; *id.* Exhibit 17.

569. *Id.* ¶171.

570. Topel Dep. at 169:19-23 (conceding that the reason for the increase in Zuffa fighter compensation in all ranking categories was “an increase in interest and demand for the services of MMA fighters generally”).

he did not dispute my analysis that “between 85 and 90 percent of bouts in 2013 to 2014 involved compensation within the range given above, between \$8,000 and \$45,000.”<sup>571</sup>

### C. Zuffa’s Economists Fail to Rebut My Conclusions Regarding Internal Equity

166. My initial report explained that one mechanism for transmitting suppressed compensation across all or almost all members of the Bout Class is Zuffa’s implementation and enforcement of the well-known concept of “internal equity,” according to which employers implement compensation structures to ensure that workers performing comparable work are compensated comparably.<sup>572</sup> None of Zuffa’s economists rebuts my conclusion that Zuffa follows a compensation structure driven by considerations of internal equity.<sup>573</sup>

### D. Zuffa’s Economists Fail to Undermine My Proof of Common Impact on the Identity Class

167. My initial report showed that common impact can be demonstrated for two subgroups of the Identity Class. The first, Identity Subgroup One, consists of those who received at least some sponsorship payments, video game payments, merchandise royalty payments, or athlete outfitting policy payments from Zuffa during the Class Period, according to Zuffa’s records. The second, Identity Subgroup Two, consists of all Fighters who executed a PAR during the Class

571. *Id.* at 172:22-173:3 (“Q. Okay. And you don’t in your report dispute Dr. Singer’s analysis that you quote, that is, that between 85 and 90 percent of bouts in 2013 to 2014 involved compensation within the range given above, between \$8,000 and \$45,000; am I right? A. That’s correct.”). And he admitted further that “the level of show compensation was close to or equal to \$8,000 or \$10,000 in approximately 50 percent of Zuffa bouts in 2014 .”);*Id.* at 173:14-24 (“Q. And I just want to understand whether it is your belief that the level of show compensation was close to or equal to \$8,000 or \$10,000 in approximately 50 percent of Zuffa bouts in 2014? A. That’s my recollection. We don’t have this minimum pay document here, do we. So that’s – but that’s my recollection. Q. Okay. A. Approximately 50 percent of Zuffa bouts in 2014 . . . the show compensation was in that interval.”).

572. Singer Report ¶¶213-215.

573. Topel Dep. at 176:9-12 (acknowledging that he does not address the concept of internal equity in his report).

Period, regardless of whether these Fighters received compensation for use of their Identity in the actual world according to the JD Edwards or Merchandise Royalty Accrual database.<sup>574</sup>

168. My initial report used my impact regressions for the Bout Class to estimate the effect of the Challenged Conduct on Identity Subgroup One.<sup>575</sup> Dr. Topel criticizes my proof of impact for Subgroup One of the Identity Class because it relies on my impact regressions.<sup>576</sup> As explained above, Dr. Topel's critiques of my impact regressions for the Bout Class are without merit.<sup>577</sup> Accordingly, Dr. Topel's claims with respect to Subgroup One of the Identity Class are also without merit.

169. With respect to Subgroup Two of the Identity Class, my initial report explains that, in the actual world, all Fighters signed away certain Identity rights in perpetuity when they executed their PARs. I went on to explain that, in the but-for world, all Fighters who executed PARs would have received at least some nominal compensation in exchange for signing away these rights in perpetuity.<sup>578</sup> My initial report conservatively estimated the value of these rights at \$2,500, the lowest amount listed on a schedule of nominal, one-time, formulaic recommended payments for the use of Fighters' Identity in the UFC Electronic Arts video game series.<sup>579</sup> Dr. Topel claims that I offer "no economic analysis, or any form of justification"<sup>580</sup> to support the \$2,500 figure. That is incorrect. My initial report explains that the estimate is a highly conservative one, based on my understanding of a Zuffa document indicating the minimum amount Zuffa was willing to pay Fighters in the actual world in exchange for Identity rights that Zuffa needed, but

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574. Singer Report Part V.

575. *Id.* ¶237.

576. Topel Report ¶273.

577. See Part II, *supra*.

578. Singer Report ¶238.

579. *Id.* ¶¶239-240.

580. Topel Report ¶274.

had neglected to acquire previously.<sup>581</sup> My initial report also explained that the estimate is conservative, because it reflects the minimum nominal compensation that Fighters received from Zuffa in exchange for use of their Identity in the actual world. In a but-for world with more competition, the payment would likely have been higher.<sup>582</sup>

170. Dr. Topel also claims that my understanding of the underlying document is incorrect.<sup>583</sup> Dr. Topel is correct to point out that the document reflects 2015 payments, and that these payments were not made in exchange for video game rights for which Zuffa had not previously contracted. However, record evidence confirms that, in 2009, Zuffa offered Fighters a minimum payment of \$625 in exchange for non-exclusive video game rights, and a minimum payment of \$2,500 for exclusive video game rights for which Zuffa had not contracted previously.<sup>584</sup> Accordingly, \$2,500 remains a reasonable and conservative estimate for the value of the Identity rights that Fighters signed away in perpetuity when they executed their PARs.

#### **IV. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY AGGREGATE DAMAGES CALCULATIONS OR MY EVALUATION OF THE BUT-FOR WORLD**

171. In my initial report, I calculate aggregate damages to the Bout Class for the Class Period through June 30, 2017 under various approaches, depending upon alternative factual underpinnings, at between \$811.2 million (removing pre-acquisition Strikeforce data) and \$1.6 billion (including pre-acquisition Strikeforce data); aggregate damages to the Identity Class are calculated at \$37.2 million.<sup>585</sup>

581. Singer Report ¶239.

582. *Id.* ¶240.

583. Topel Report ¶275.

584. See, e.g., ZFL-0223914 (offering Fabricio Werdum \$2,500 in exchange for exclusive video game rights and \$625 in exchange for non-exclusive rights); see also ZFL-0393217; ZFL-0393223; ZFL-0393226; ZFL-0393229; ZFL-0393238 (showing the same payment structure offered to other Fighters).

585. Singer Report ¶¶245-256. Aggregate damages to Identity Subgroup One are estimated at \$32.6 million from the beginning of the Class Period through June 30, 2017. Over the same time-period, aggregate damages to

172. As explained below, Zuffa's expert's critiques of my aggregate damages calculations are without merit. In addition, Dr. Topel claims that my initial report fails to "specify or analyze a meaningful 'but-for' market structure"<sup>586</sup> because my initial report does not set out with specificity what the contracting arrangements, among other details, would look like in the but-for world.<sup>587</sup> As explained below, this critique is misguided. Nevertheless, below I elaborate on my view of Zuffa's plausible contracting arrangements in the but-for world, based on Dr. Topel's own reasoning and relevant record evidence. My primary computation of aggregate damages to the Bout Class is the \$1.6 billion figure that flows from my impact regression that utilizes the UFC and Strikeforce bout data (as there is no empirical basis to discard either set of data).

#### **A. Aggregate Damages to the Bout Class**

173. As explained below, Zuffa's economists' critiques of my aggregate damages calculations for the Bout Class are without merit, as are their critiques of my construction of the but-for world.

##### **1. The Impact Regression Benchmark Is Sound and Reasonable**

174. My initial report used my impact regression model to estimate aggregate damages.<sup>588</sup> As explained in Part II.B above, my impact regressions include both Strikeforce pre-acquisition bout data and Zuffa's own bout data; Strikeforce pre-acquisition bouts are one of the best available benchmarks for the share of revenue that Fighters would receive in a competitive

Identity Subgroup Two are calculated at \$4.5 million. *Id.* If, in the alternative, I use the \$625 figure noted above (instead of \$2,500) to calculate damages to Subgroup Two, then damages to Subgroup Two are calculated at one quarter the prior amount, or  $0.25 \times \$4.5\text{ million} = \$1.125\text{ million}$ .

586. Topel Report ¶30.

587. *Id.*

588. Singer Report ¶¶251-252.

market and are appropriately included in my impact regressions. The results of my impact regression demonstrate that, after controlling for a range of factors that affect the compensation of MMA Fighters (a total of 270 control variables, in addition to 1,396 Fighter fixed effects),<sup>589</sup> an increase in Zuffa's foreclosure share leads to an economically and statistically significant decrease in the share of Event Revenue paid to Zuffa Fighters.<sup>590</sup> According to this model, Fighters would have been paid approximately 69 percent of Zuffa's Event Revenue in the but-for world during the Class Period, instead of the 19.5 percent they received in the actual world, yielding aggregate damages of \$1.6 billion.<sup>591</sup> As explained in Part II above, Zuffa's economists' critiques of my impact regression model are without merit.

## **2. The Zuffa Foreclosure Regression Benchmark Is Sound and Reasonable**

175. My initial report estimated an alternative version of my regression model that dropped the Strikeforce pre-acquisition bouts, and included only Zuffa's own bout data. As I explain in Part II.B above, Strikeforce pre-acquisition bouts are one of the best available benchmarks for the share of revenue that Fighters would receive in a competitive market, and thus the best results are those that include the Strikeforce data. But because I anticipated that Zuffa's economists might challenge the inclusion of the Strikeforce data, I specified in the alternative a model that excluded the Strikeforce bout data, the purpose of which was to isolate the statistical relationship between Zuffa's foreclosure share alone and its own Fighter Shares over time.<sup>592</sup> According to this damages model, Fighters would have been paid approximately 47 percent of Zuffa's Event Revenue in the but-for world during the Class Period, instead of the 19.5 percent

589. These fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.

590. Singer Report Part III.D.1.

591. Singer Report ¶¶251-252; *id.* Table 11.

592. *Id.* ¶249.

they received in the actual world, yielding aggregate damages of \$894.3 million.<sup>593</sup> As explained in Part II.B.4 above, Dr. Topel's critiques of this damages model are without merit.

### **3. The Strikeforce and Bellator Benchmarks Are Sound and Reasonable**

176. For my Strikeforce and Bellator damages benchmark, I calculated the share of revenue that Strikeforce and Bellator paid to their Fighters. According to financials produced by these promoters, Strikeforce paid approximately 63 percent of its revenue to Fighters, and Bellator paid approximately █ percent of its revenue to Fighters.<sup>594</sup> Aggregate damages are calculated by determining how much higher Fighter compensation would have been, had Zuffa paid its own Fighters the same percentage of its Event Revenue that Strikeforce and Bellator paid to their own Fighters. Dr. Blair claims that MMA promoters such as Bellator are not valid benchmarks because they failed to consistently achieve profitability.<sup>595</sup> This critique assumes that Fighter costs, and not some other factors, have prevented these promoters from achieving profitability. This assumption is incorrect, and contradicts both economic theory and the available empirical evidence.

177. According to elementary economic theory, firms may fail to achieve profitability because they do not achieve sufficient scale, and are unable to sufficiently exploit scale economies.<sup>596</sup> Scale economies exist when there are significant fixed costs that must be spread across a sufficiently large volume of output to reduce a firm's average cost. Yet Fighter costs are variable costs, not fixed. It is therefore not reasonable to assume that Fighter costs for non-dominant MMA promoters would decline as a percentage of revenue in a but-for world, given that

593. *Id.* ¶¶249-250; *id.* Table 10.

594. *Id.* ¶247. Due to limitations in the Strikeforce and Bellator data, I conservatively compare the share of total revenue that Strikeforce and Bellator paid to their Fighters, respectively, to the share of Event Revenue that Zuffa paid to its Fighters. *Id.* n. 576.

595. Blair Report ¶74.

596. Katz & Rosen at 283-284.

the labor market would have been more competitive in the but-for world than in the actual world. (On the other hand, Fighter costs would be expected make up a smaller percentage of revenue for a dominant firm that exercises monopsony power; this is precisely what my impact regressions demonstrate).

178. Strikeforce's financial documents confirm that Strikeforce achieved profitability on many events while paying a high percentage of Event Revenue to its Fighters. In two events held in November and December of 2009, Strikeforce earned Event Revenue of \$2.97 million, and paid its Fighters \$1.74 million, equal to 59 percent of its Event Revenue.<sup>597</sup> Over this time period, Strikeforce earned positive profits on its events (as measured by its event EBITDA), of \$0.39 million, or 13.1 percent of its Event Revenue. From January through July of 2011, on a total of six events, Strikeforce earned Event Revenue of \$13.8 million, and paid its Fighters \$9.1 million, equal to 66 percent of this amount, while earning an event EBITDA of \$0.49 million, or 3.6 percent of Event Revenue.<sup>598</sup> That Strikeforce earned incremental net income on these events is proof that its payments to Fighters were not the cause of its global losses.

179. Strikeforce's financial documents also provide Strikeforce's projected earnings on a total of 23 events spanning September 2011 through February of 2014.<sup>599</sup> These projections confirm that Strikeforce expected to continue to earn profits on its events going forward, and also expected to continue to pay a high share of Event Revenue to its Fighters.<sup>600</sup> Strikeforce's projected Event Revenue in these 23 events totals \$51.6 million, and its projected payments to

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597. ZFL-1472338.

598. *Id.*

599. *Id.*

600. In addition, Strikeforce founder Scott Coker testified that Strikeforce's business model involved "mak[ing] sure that the fighters received 65% of the revenue," while achieving profitability over the long run. Coker Dep. at 21:15-18, 25:8-25.

Fighters total \$27.8 million, or 54 percent of Event Revenue.<sup>601</sup> Strikeforce's projected event EBIDTA over this time period comes to \$11.5 million, or 22.3 percent of its projected revenue.<sup>602</sup> That Strikeforce expected to earn incremental net income on these events is further proof that payments to Fighters were not the cause of its global losses.

180. Although Bellator has not produced event-level financials, Bellator's financial documents confirm that Fighter costs, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

181. Dr. Topel does not reject the use of Strikeforce and Bellator as benchmarks. In fact, *he agrees* that both are "natural candidates for a competitive benchmark."<sup>606</sup> Dr. Topel simply repeats his argument that instead of using wage share (as I do), the level of compensation paid by

601. ZFL-1472338.

602. *Id.*

603. SBPCL00002101.

604. *Id.*

605. *Id.*

606. Topel Report ¶287. *See also* Topel Dep. at 59:15-21 ("So you'd need some kind of controlled experiment about how a firm in similar circumstances employed people and paid people or maybe in some market identifiably similar circumstances where arguably the existence of that market power you refer to did not exist or existed at some lower level."); Blair Dep. at 335:23-336:10 ("[I]t's important to think in terms of, you know, are these entities comparable in a variety of things? You know, are they offering, you know, the same product? Do they have the same quality management? You know, are they engaged in the same sort of promotion? You know, to the extent that the goods or services being produced by the yardstick are different, you know, are they similar enough so that, again – you know, the purpose of the yardstick is – analysis is to draw an inference about the plaintiff based on the performance of the yardstick. And so you want them to be very comparable."); *id.* at 334:9-19 ("same industry").

these other MMA promoters should be used.<sup>607</sup> But as I explained in my initial report, the Challenged Conduct suppressed the revenues and profitability of other MMA promoters, by blocking access to a deep pool of talented Fighters, a critical input necessary for a successful MMA promotion.<sup>608</sup> Because the Challenged Conduct suppressed the level of compensation paid by other MMA promoters (along with their revenues), compensation *levels* at these firms are not an appropriate competitive benchmark. In contrast, the *share* of event revenue paid to Fighters is a valid competitive benchmark, reflecting the share of MRP that Fighters would receive in the absence of the Challenged Conduct.<sup>609</sup> Indeed, my initial report performed a standard statistical test indicting that the share of Event Revenue paid to Strikeforce Fighters was unaffected by Zuffa's foreclosure share, and therefore untainted by the Challenged Conduct.<sup>610</sup>

182. If Dr. Topel were correct in claiming that compensation *levels* paid by Strikeforce and Bellator are the appropriate benchmarks, then application of Dr. Topel's benchmark would lead to the economically nonsensical conclusion that Zuffa consistently paid its Fighters *above* the competitive level. As Dr. Topel admits: "In each case these competitive benchmarks indicate that Zuffa was paying *more than competitive compensation* to its athletes[.]"<sup>611</sup> Dr. Topel provides no justification for his result that a profit-maximizing entity such as Zuffa would voluntarily pay

607. Topel Report ¶¶286-288.

608. Singer Report ¶¶156-166.

609. *Id.* ¶183, n. 454 ("although the Challenged Conduct, by reducing revenue opportunities for rival promoters, might have suppressed the *level* of compensation that Strikeforce (and other would-be rivals) could afford to pay to Fighters, the *share* of revenue paid to Fighters by Strikeforce remains an economically relevant benchmark for estimating but-for compensation") (emphasis in original). Another reason that I analyzed compensation shares is that including compensation as an explanatory variable in the model results in simultaneity bias. See Part II.D.2, *supra*.

610. Singer Report ¶183, n. 454 (explaining that "my regression analysis confirms that Zuffa's foreclosure (before the Class Period) did *not* significantly affect the Fighter Shares of pre-acquisition Strikeforce Fighters."). According to Dr. Oyer, entities with greater revenues "may pay a higher share of their revenue to athletes" than smaller-scale entities with less revenue, because smaller-scale entities "may be subject to much higher administrative costs as a percentage of revenue." See Oyer Dep. 171:4-11; Oyer Report ¶58. This implies that the share of revenue that Strikeforce paid its Fighters is a conservative benchmark for the share of revenue that Zuffa would have paid its Fighters under more competitive conditions.

611. Topel Report ¶287 (emphasis added).

substantially above-market compensation to its Fighters. Dr. Topel's result violates basic economic principles, according to which profit-maximizing firms minimize their costs.<sup>612</sup>

#### **B. Aggregate Damages to the Identity Class**

183. As explained above, my initial report analyzed two subgroups of the Identity Class. The first, Identity Subgroup One, consists of those who received at least some sponsorship payments, video game payments, merchandise royalty payments, or athlete outfitting policy payments from Zuffa during the Class Period, according to Zuffa's records. The second, Identity Subgroup Two, consists of all Fighters who executed a PAR during the Class Period, regardless of whether these Fighters received compensation for use of their Identity in the actual world according to the JD Edwards or Merchandise Royalty Accrual database.<sup>613</sup>

184. My initial report used my impact regression model to estimate damages to Identity Subgroup One, and calculated aggregate damages of \$32.6 million.<sup>614</sup> As explained in Part II above, Zuffa's economists' critiques of my impact regression model are without merit.

185. My initial report calculates aggregate damages to Identity Subgroup Two by multiplying the estimated number of PARs executed from the beginning of the Class Period through June 30, 2017 by a minimal payment of \$2,500, the lowest payment on a schedule of nominal, one-time, formulaic recommended payments for the use of Fighters' Identities in the UFC Electronic Arts video game series, yielding aggregate damages to Identity Subgroup Two of \$4.5 million.<sup>615</sup> As explained in Part III.D above, although Dr. Topel's critique of the document

612. Katz & Rosen at 259; *id.* Chapter 9.

613. Singer Report ¶233.

614. *Id.* ¶¶253-254.

615. *Id.* ¶255.

underlying my original \$2,500 estimate has some validity, there are other record documents that support the \$2,500 figure, rendering Dr. Topel's criticism moot.

186. With respect to damages, Dr. Topel also claims that, because the recommended \$2,500 payments were actually made to some Fighters, there is no basis for assuming that additional payments in this amount would have occurred in the but-for world.<sup>616</sup> But any such payments made to Fighters in the actual world were made in exchange for use of their Identities in a video game series. In contrast, damages to Identity Subgroup Two reflect the value of Identity rights used in connection with promoting Zuffa bouts or the UFC brand, which Fighters signed away in perpetuity when they executed their PARs.<sup>617</sup> From an economic perspective, it is clear that Zuffa would not have been willing to compensate Fighters in exchange for the use of rights that Zuffa already owned. Therefore, that (some) Fighters received payments in exchange for their use in the a video game series does not imply that these Fighters were being compensated for Identity rights used in connection with promoting Zuffa bouts or the UFC brand, which all Fighters signed away at the time their PARs were executed.<sup>618</sup>

### C. Dr. Topel's Critiques of My Construction of the But-For World Are Without Merit

187. As explained below, Dr. Topel's critique that I fail to define the but-for world with sufficient specificity is misguided. Nevertheless, below I elaborate on my view of Zuffa's plausible contracting arrangements in the but-for world. I also explain why the most plausible damages estimate is the \$1.6 billion calculation that flows from my impact regression.

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616. Topel Report ¶291.

617. Singer Report ¶238.

618. *Id.* ("For Subgroup Two, this but-for compensation is independent of whether the Fighter received any other compensation, including any JDE identity payments or merchandise royalty accruals.").

**1. A Plausible But-For World Would Include Substantially Shorter Fighter Contracts, and Substantially Fewer Restrictions on Fighter Mobility**

188. Dr. Topel claims that my initial report fails to “specify or analyze a meaningful “but-for” market structure”<sup>619</sup> because my initial report purportedly does not set out with sufficient specificity what the contracting arrangements, among other details, would look like in the but-for world.<sup>620</sup> This critique is misguided. My role in assessing the economic effects of the Challenged Conduct is to compare the actual world to a world that is otherwise identical except for the Challenged Conduct. And that is what I did. My initial report calculates Zuffa’s foreclosure share based on the proportion of Fighters in the Relevant Input Market and Submarket subject to Zuffa’s exclusionary contracts—holding everything else constant. Dr. Topel himself acknowledges that my damages calculations isolate the effect of Zuffa’s exclusionary contracts on Class members.<sup>621</sup> To the extent that other aspects of the Challenged Conduct suppressed Fighter compensation, my damages estimates are therefore conservative. A reduction in the share of Fighters bound by these exclusionary contracts results in increased competition, and hence greater compensation for Fighters. In particular, my damages model projects but-for wage shares for Zuffa Fighters when the foreclosure share falls to 30 percent—that is, in a but-for world where Zuffa forecloses up to 30 percent of the Relevant Input Market with the challenged contracts.<sup>622</sup> There are many potential

619. Topel Report ¶30.

620. *Id.*

621. *Id.* ¶201 (“[W]hen computing damages using his foreclosure regression benchmark, Dr. Singer only estimates the harm due to the alleged foreclosure provisions. Dr. Singer makes no attempt to establish that there was anticompetitive harm from other elements of Plaintiffs’ Challenged Conduct apart from the exclusive aspect of PAR contracts or to estimate damages attributed to those elements[.]”). As Dr. Topel acknowledges, the element of the Challenged Conduct for which my regression computes impact or damages is the allegedly exclusionary contractual provisions. The other elements of the Challenged Conduct contribute to impact or damages only to the extent that they cause more Fighters to sign the challenged contracts.

622. Singer Report ¶¶250, 252. I have conservatively assumed that Zuffa could have foreclosed up to 30 percent of the Relevant Input Market with long-term exclusive contracts of the type it currently uses given that, as I understand it, certain legal decisions find that a firm with market power can foreclose up to 30 percent of a market without having anticompetitive effects. *Id.* ¶153.

procompetitive industry arrangements that would have existed absent the Challenged Conduct, and in particular, absent the challenged exclusionary provisions in Zuffa's Fighter contracts.

189. I nonetheless elaborate here on my view of Zuffa's plausible contracting arrangements in the but-for world, based on Dr. Topel's own reasoning and relevant record evidence. One source of evidence to inform this aspect of a world without the challenged contracts would be to look to the Fighter contracts that Zuffa used *before* its market power had expanded to the levels observed during the Class Period, combined with an assessment of the fighter contracts of smaller MMA promotions that lack substantial market power. As Dr. Topel has opined, in certain contexts, conduct engaged in by firms without substantial market power can (though as discussed below, often do not) reflect procompetitive responses to competition.<sup>623</sup>

190. Before discussing this analysis of a possible but-for world, some important caveats are in order. As I explain in Part V.C below, the claim that Zuffa's conduct (including the challenged contracts) can be justified as procompetitive because similar conduct is undertaken by non-dominant MMA promoters is wrong as a matter of economics and antitrust. *First*, as Dr. Topel himself admits, it is well recognized in economics that conduct engaged in by a firm without market power can be anticompetitive when engaged in by a firm with market power.<sup>624</sup> Thus, the mere fact that Strikeforce or some other smaller MMA Promoter engages in certain conduct does not mean that the same conduct would be procompetitive when Zuffa engages in it. *Second*, smaller firms in a market might engage in certain conduct, not because it is procompetitive, but

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623. See Topel Report ¶25.

624. See Topel Dep. at 358:20-25 ("Q. Would you agree with me that the conduct engaged in by a firm without market power . . . could have anticompetitive effects when that same conduct is engaged in by a firm with market power? A. That's conceivable."); see also Salop (2017) at 374, n.10 ("...where the conduct by a competitive firm is determined to be procompetitive, that showing alone does not imply that the same conduct by a dominant firm would be procompetitive").

rather as a strategic response to competing in a market with the dominant firm. For example, when there is a single dominant firm and a “fringe” of smaller, competitive firms in an industry, the competitive firms do not charge the competitive market price; they charge the same price as the dominant firm.<sup>625</sup> Indeed, Dr. Blair acknowledged that he would expect that just as in markets where a cartel is operating and fringe firms not part of the cartel conform their pricing to that of the cartel, he would expect that fringe MMA promotions would conform to the UFC’s contracting policies for strategic reasons.<sup>626</sup> Thus, for example, Bellator appears to have implemented and continued its use of the Right to Match provision in its contracts because Zuffa had those provisions in its own contracts.<sup>627</sup> The same is likely true for other aspects of the contracts used by smaller MMA promoters. Third, it is quite possible that smaller MMA promotions, including in particular those in other geographic markets like Pride or One Championship, may well have had some monopsony power.<sup>628</sup> Accordingly, it may well be that smaller MMA promotions had some of the challenged contractual provisions as a means to exercise some monopsony power, and not for procompetitive reasons. The same logic applies to Zuffa before the Class Period. Although it is true that Zuffa likely had *less* market power when its share of the Relevant Input Market was

625. See Modern IO at 110-119.

626. Blair Dep. at 112:25-115:6 (“Q. Does the same logic of [the umbrella pricing] model apply … to non-price transactional terms such as who bears the risk of injury, for example? A. … [W]hen we start to talk about some of these terms … one would expect … maybe not initially, but you would expect the terms to wind up being roughly the same … in a market … just through adjustments over time as you move to an equilibrium.”).

627. See Part V.C.1, *infra*. See also Coker Dep. at 245:3-246:9. See also Topel Dep. at 350:17-351:1 (“Q. Is it fair to say from that testimony that one of the reasons why Mr. Coker implemented the right to match was a strategic response to the fact that the UFC also had the right to match in its contracts? A. Well, that’s one reason. He’s noticed that UFC has this and UFC’s able to – the operative word down here at the end of his first answer is ‘For us to be competitive we had to put [the Right to Match Clause] in there as well.’”); *id.* at 347:9-16 (admits that he’s aware of “evidence in the record that Strikeforce or Bellator said – or the executives at Strikeforce or Bellator said that they based their contracts with their athletes in part on the fact that the UFC used similar contracts with its athletes”).

628. For instance, Zuffa was quite clear that it was the “major leagues” and other MMA promotions were the “minor leagues.” See Singer Report ¶¶105-106. It is plausible that within the minor leagues, at any particular time, one or more MMA promotions was able to exercise some monopsony power. Dr. Topel admits that a small firm can have some degree of monopsony power. See also, e.g., Topel Dep. at 346:11-13 (admitting that smaller MMA promotions likely had some degree of monopsony power).

lower, it still likely had substantial market power well before the Class Period. Thus, the mere fact that Zuffa utilized certain contractual provisions in earlier time periods does not imply that the challenged contractual provisions were procompetitive.

191. With those caveats in mind, it is nonetheless plausible that contracts of smaller or fringe MMA promotions or those that Zuffa used in the early 2000s, when it had less market power than it has today, would be more likely to be procompetitive than the contracts that Zuffa uses today. Accordingly, it is at least instructive to compare Zuffa's contracts in the early 2000s and those of smaller MMA promotions to those Zuffa implemented during the Class Period. For instance, Zuffa's standard PAR in 2003 had a term of one year (from the date of execution) or three bouts, substantially shorter than the current standard term of 4 bouts or 20 months (extending from the date of the first bout and excluding the Exclusive Negotiation and Right-to-Match periods).<sup>629</sup> As my initial report explains, Zuffa's top Fighters were bound by even longer-term contracts than other Fighters.<sup>630</sup> The median duration of exclusivity in Zuffa's fighter contracts—including in particular the terms of the higher ranked and thus more valuable Fighters—has substantially increased over time as well, indicating that substantially shorter contracts are more

629. See 30(b)(6) Deposition of Kirk Hendrick, November 29, 2016, Exhibit 2, Tab 29 (citing (December 2003 Standard Agreement (ZFL-2648535) (Article 5.1) with term starting at signature not at the date of the first bout as the current standard PARs provide). Dr. Topel conceded that Zuffa used shorter contracts when Zuffa had a smaller share of the MMA market. See Topel Dep. at 330:3-14 (“Q. The contracts that were shorter early on when Zuffa had a smaller market share, were those efficient? A. In the context of the industry at the time I suspect they were. Q. Were those procompetitive? A. ... [R]emember what my – what my analysis says. When firms that have no evident market power are using a practice, one can generally infer that there’s a procompetitive rationale for the elements of those contracts.”). Prof. Topel acknowledged as well that Zuffa invested substantial resources in developing the sport of MMA and promoting MMA athletes in the early 2000s, even when it had shorter term contracts. See *id.* at 330:24-331:10 (“Q. You would agree that during the early 2000s Zuffa invested substantial resources in developing the sport of MMA, right? A. Yes. And in promoting MMA athletes, correct? A. Yes. Q. And it did so even with no evident market power, correct? A. Yes. And it did so with contracts of shorter duration, correct? A. That’s your representation, yes.”).

630. Singer Report ¶174.

competitive. By 2015, the median contractual duration for a top five Fighter was 50 months; for a Headliner, the median duration was 40 months; for all other Fighters, it was 35 months.

192. Zuffa's standard 2003 PAR agreement still, of course, was "multi-bout," had the Right-to-Match and certain other challenged provisions (such as, *e.g.*, the Champion's Clause and tolling provisions). But even at this time, Zuffa was likely the dominant MMA promoter (with a first mover advantage), and thus its contracts are likely not fully reflective of competitive contracting practices. Accordingly, even though the contracts of smaller or fringe MMA promotions likely include anticompetitive clauses as a strategic reaction to Zuffa as the dominant MMA player (as explained in Part V.C below), it would potentially be instructive to compare them to Zuffa's during the Class Period.

193. As to the length of the term, Dr. Topel recognized that smaller MMA promotions use single-bout contracts.<sup>631</sup> Accordingly, given that some smaller MMA promotions utilize single-bout contracts, even the one-year/three-bout contract may be unduly restrictive.

194. As pointed out above, Bellator stated that it would have removed the Right-to-Match provision if Zuffa had agreed to do the same, indicating that Bellator was using the provision as a strategic response to Zuffa, and not for procompetitive reasons. Given that Bellator was one of the larger of the fringe MMA promotions, it stands to reason that if Zuffa and Bellator eliminated the provision, other MMA promotions would have as well. Thus, following this logic, the predominant procompetitive but-for contract would not have a Right-to-Match provision.

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631. *See, e.g.*, Topel Dep. at 288:10-23 ("Q. Would it be fair to say that even if Zuffa were required to only have single-bout contracts, it would still have some incentive to invest in promoting the UFC, correct? ... A. I suppose that might be true. I mean, I don't know the answer to your question because I suppose we have some comparisons to smaller outfits, King of the Cage or something like that. I mean, they have websites that say here with the fighters they have and historically have and here's the casino we're having a show in. So I believe those folks have shorter contracts.").

195. Further, several smaller MMA promotions had what were known as “Zuffa-out” clauses, which were provisions that allowed Fighters out of their contracts if they received an offer from Zuffa to fight for the UFC.<sup>632</sup> Dr. Topel conceded that smaller MMA promotions had such “out clauses,”<sup>633</sup> and opined that Zuffa “out clauses” are efficient and procompetitive.<sup>634</sup> Because the point of a Zuffa-out clause is to allow fighters contending in a smaller promotion to leave should the UFC “major league” come calling, the analog to a “Zuffa out” clause for Zuffa in the but-for world could well be clauses in Zuffa’s contracts that allow its fighters to leave to fight for another promotion in certain situations advantageous to the advancement of the Fighter’s career, such as where it would allow a matchup highly anticipated by fans, or simply to provide the Fighter with a better career or athletic development. For instance, as an analog to the Zuffa-out clause in a more competitive world, Fighters could be granted the ability to obtain free agency after only a year under contract with an MMA promotion, regardless of tolling or other extension provisions, thereby offering a Fighter enhanced mobility and bargaining leverage. As such, it would effectively negate certain provisions, such as Champion’s Clause or the tolling provisions,

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632. Singer Report ¶107; *id.* ¶¶135-136.

633. See Topel Dep. at 319:16-320:7 (“Q. In your review of contracts from non-Zuffa MMA promotions did you become aware that many of them had what the UFC itself has referred to as UFC out or Zuffa out clauses? A. I’m aware of that, yes. Q. And are you aware that those clauses provide that if any of their fighters want to go to the UFC and the UFC wants to sign them, the fighter can break his or her existing contract with that promotion without any penalties? A. Yes. ... Q. And is it your view that that is efficient? A. It’s what the contracting parties agreed on.”); *id.* at 321:23-322:25 (acknowledging that MMA promotions with Zuffa out clauses “recognize in advance that their best fighters could leave and go to Zuffa at any time”).

634. See *id.* at 323:9-23 (“Q. So MMA promotions that don’t have market power use a provision that would allow them to go to Zuffa in order to attract them to come to their promotion; is that your opinion? A. Some entities include in their contract in order to attract fighters the right to move to Zuffa. Q. [I]s that efficient? A. Well, given that it survives for those entities, it’s probably an efficient way of attracting people.”); see also *id.* at 324:25-325:10 (admitting that Zuffa-out clauses used by Zuffa’s rivals without market power are procompetitive by virtue of prior logic that undergirds his efficiency defense of certain restrictions, and stating “For these entities in the situations that they’re in the fact that they use a business practice that . . . don’t have any material market power, the fact that they use that business practice means that it has a procompetitive rationale for them”).

that can (along with Zuffa's current power to coerce Fighters to re-sign before the end of the contracts) make Zuffa's current contracts effectively perpetual.

196. Other aspects of the but-for world contracting scheme could also be characterized based on the benchmarks provided by MMA promoters that lack market power. For example, smaller MMA promotions frequently engaged in co-promotion with another MMA promotion, or allowed Fighters to enter bouts with another promotion.<sup>635</sup> And, indeed, even Zuffa itself recently engaged in co-promotion in a market in which it did not have market power, namely, boxing. Thus, in a but-for world, we would expect to see enhanced co-promotion—that is, Fighters from different MMA promotions matched against each other. Given the heightened state of competition, promoters would maintain substantial incentives to engage in promotional activity. Even Dr. Topel admitted that if Zuffa were required to only have single-bout contracts, it would still have an incentive to invest in promoting fights.<sup>636</sup> He further admitted that it would not be procompetitive for Zuffa to lock up fighters for life because “Zuffa would capture the entire returns to their human capital investments,”<sup>637</sup> and that promotions with Zuffa-out clauses still have an incentive to invest in the promotion of their fighters.<sup>638</sup>

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635. See Part V.A.2, *infra*.

636. Topel Dep. at 288:10-23 (“Q. Would it be fair to say that even if Zuffa were required to only have single-bout contracts, it would still have some incentive to invest in promoting the UFC, correct? ... A. I suppose that might be true. I mean, I don’t know the answer to your question because I suppose we have some comparisons to smaller outfits, King of the Cage or something like that. I mean, they have websites that say here with the fighters they have and historically have and here’s the casino we’re having a show in. So I believe those folks have shorter contracts.”).

637. *Id.* at 291:16-25 (“Q. You’re an economist and I’m asking you whether it would be procompetitive if it were legal for Zuffa to require as a condition to fighting with the UFC that the fighter could never fight for another MMA promotion? A. I doubt it. Q. Why not? A. Because as people’s talents play out...you know, Zuffa would capture the entire returns to their human capital investments.”).

638. *Id.* at 323:1-8 (“Q. And is it your understanding that despite these Zuffa out clauses these MMA promotions that have these clauses still have incentive to invest in their promotion of their fighters? A. They have some incentive to invest, and in order to attract them they have a clause that gave those fighters the right to go to a particular entity.”).

197. In the but-for world, other MMA promoters would be able to compete effectively with Zuffa for Fighter services, because they would not be foreclosed from a critical input.<sup>639</sup> Competition in the but-for world would lead MMA promoters, including the UFC, to increase the compensation they pay to their Fighters relative to the actual world. And the increased compensation in turn would attract more athletes to the sport and cause them to invest more in their performances: In the but-for world, Fighters and their management would have the incentive and the ability to invest more in their own promotion and training, thereby enhancing and improving the sport of MMA.<sup>640</sup> The increase in the number of competitive MMA promoters means that the market would, to use Dr. Oyer's term, become "thicker."<sup>641</sup> As Dr. Oyer admitted, in a "thicker labor market with more employees and workers," there would be greater surplus and greater productivity, but any given firm is likely to get a smaller share of that surplus because the competition, among other things," would "force the firm to pay higher wages to the worker."<sup>642</sup> In other words, without the Challenged Conduct there would be greater productivity—that is, more and better events—and greater surplus—that is, the promoters and the fighters would have more total revenue to share—and the workers—that is, the Fighters—would receive greater compensation—even though any given firm—that is, the UFC—might enjoy less of the overall revenue from MMA.

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639. Singer Report Part III.C.1.

640. See Part V.A.1, *infra* (reviewing the literature on non-compete clauses showing that contracts that prevent locked-in workers from taking their developed talents to a rival can discourage employees from investing in their own human capital, and finding that the overall effect of restraints on worker mobility is a to reduce human capital investments).

641. See Oyer Dep. at 193:19-22 (noting "a thicker labor market is one with more participants and a thinner one is one with fewer participants").

642. *Id.* at 200:20-201:3 ("Q: Okay. So in the thicker labor market with more employers and more workers, all else equal, what we expect is greater surplus and greater productivity, but any given firm is likely to get a smaller share of that surplus because the competition, among other things, can force the firm to pay higher wages to the worker? A. Yeah. And—exactly."); see also *id.* at 201:17-202:3 ("a thicker market . . . means that there are more employers and more workers and will tend to create overall surplus and overall productivity and higher wages or higher compensation, but lower amounts of surplus may go to any one employer; is that fair? A: Yes.").)

198. In summary, based on Dr. Topel's own reasoning and the record evidence recounted above, a plausible but-for world would include substantially shorter duration fighter contracts (of one year or less), with no Right-to-Match provision, clauses that allow fighters enhanced mobility, an easier and more certain route to free-agency, and enhanced co-promotion. Even with less market power, Zuffa and its MMA rivals would have sufficient incentives to invest in promotions and Fighters. And because Fighters would keep a greater share of their MRP, Fighters would have added incentive to invest in training and promoting themselves in the but-for world.

## **2. The Most Plausible Damages Result Is The \$1.6 Billion Calculation Derived From My Impact Regression**

199. Among my damages estimates, the most plausible result is the \$1.6 billion calculation given by my impact regression. This model makes robust use of both the Zuffa bout data over time as well as the pre-acquisition Strikeforce data. This model conservatively assumes that Zuffa's foreclosure share would be 30 percent in the but-for world. In this but-for world, Zuffa Fighters would receive a substantially higher share of Event Revenue. The increase in Fighters' share of Event Revenue is informed by both: (1) the effect of Zuffa's increasing foreclosure share over time on Zuffa Fighter Shares, relative to those of Zuffa Fighters in time periods with lower foreclosure shares, after controlling for all other variables in the regression; and (2) the effect of Strikeforce Fighter Shares (prior to the acquisition) exceeding Zuffa Fighter Shares (again, after controlling for all other variables in the regression).<sup>643</sup> As explained in Part II.A above, there is no valid econometric basis for discarding Strikeforce pre-acquisition bouts from the impact regression; to the contrary, Strikeforce pre-acquisition bouts are one of the best available

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643. Singer Report ¶183.

benchmarks for the share of revenue that Fighters would receive in a competitive market and are appropriately included in the impact regressions. Indeed, Dr. Topel agrees that other MMA promoters such as Strikeforce are “natural” competitive benchmarks to use in this case.<sup>644</sup>

200. My initial report explained that, for a variety of reasons, damages should not be constrained by the contemporaneous revenue and profit earned by Zuffa in the actual world, in which output was artificially suppressed by the Challenged Conduct.<sup>645</sup> Thus, the appropriate analysis looks to the available revenues earned by Zuffa and other MMA promoters in the but-for world. Dr. Topel agrees with me that the appropriate analysis of damages looks to the but-for world, and not the actual world, to determine the pool of revenues available to pay Fighters.<sup>646</sup>

201. Although all Bout Class members would earn higher compensation in the but-for world, presumably not all of them would fight for Zuffa in that newly competitive environment. In the but-for world, other MMA promoters would have been able to attract more Fighters, would have earned higher revenue, and would have paid competitive compensation to those Fighters. And Zuffa would have had a choice: pay its Fighters higher, competitive compensation, or the Fighters would switch to another MMA promotion that paid competitive compensation.

202. Further, the output of Live MMA Events would have expanded in a but-for world absent the Challenged Conduct, which would generate more industrywide revenue with which to compensate Fighters.<sup>647</sup> To quantify this effect, I performed an analysis to conservatively estimate how much total industry Event Revenue would have expanded in the but-for world, had the Challenged Conduct not restricted the supply of Live MMA Events. As explained below, I

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644. Topel Report ¶287. Dr. Blair recognizes that “Bellator (and Strikeforce before it) competed against Zuffa in the market, and were thus subject to market forces in part affected by Zuffa’s competition.” Blair Report ¶73.

645. Singer Report ¶246.

646. Topel Dep. at 422:22-423:18, 425:9-426:3.

647. Singer Report ¶246; *see also* Part I.B.3, *supra*.

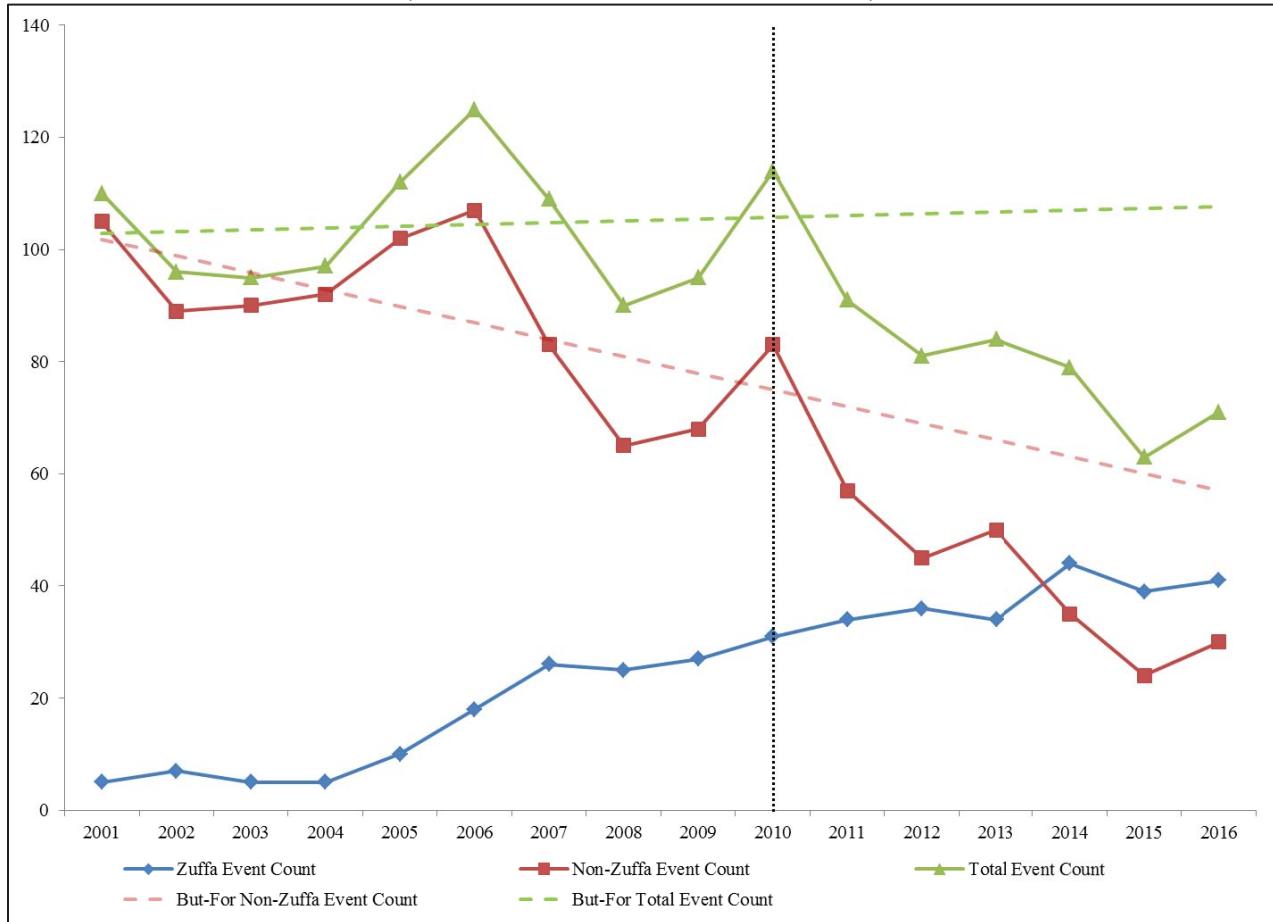
conservatively estimate that, in the but-for world, the *additional* industrywide Event Revenue over the Class Period would have been between \$1.4 billion and \$2.1 billion, resulting in total industrywide revenues between \$5.1 billion and \$5.8 billion. That would yield more than enough Event Revenue in the but-for world to cover the \$1.6 billion from my best damages estimate.

203. In my initial report, I demonstrated that the supply of Live MMA Events featuring at least one Headliner had an essentially flat trend from 2001 to 2010, but declined substantially during the Class Period.<sup>648</sup> As seen below, the supply of such events from non-Zuffa promoters dropped off steeply, while the supply of such events from Zuffa did not increase by nearly enough to make up the difference.

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648. Singer Report Figure 4C.

**SUPPLY OF LIVE MMA EVENTS FEATURING HEADLINERS  
(SINGER INITIAL REPORT, FIGURE 4C)**



Note: Non-Zuffa Promoters include those encompassed by the Headliner definition of the Relevant Input Market. Events featuring at least one Headliner are displayed.

204. If the total supply of events featuring Headliners had continued along an essentially flat trend during the Class Period, as projected by the green dotted line above, I estimate that industry Event Revenue would have increased by \$1.4 billion during the Class Period, relative to the actual world, resulting in total industry Event Revenue of \$5.1 billion during the Class Period.<sup>649</sup> Accordingly, there would have been more than enough Event Revenue in the but-for

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649. See Appendix Table A5. To estimate the number of Live MMA Events featuring Headliners in the but-for world, I used the trend line for total industry events shown in Figure 4C of my initial report. According to Figure 4C, the pre-2011 trend was essentially flat; therefore, according to this projection, the supply of these events would have

world to cover the \$1.6 billion from my best damages estimate: Zuffa's actual payments to the Bout Class during the Class Period came to [REDACTED] = \$620 million.<sup>650</sup> In the but-for world, total payments to the Bout Class would have been \$620 million + \$1.6 billion = \$2.2 billion. This comes to approximately 43 percent of total but-for industry event revenue (equal to \$2.2 billion / \$5.1 billion).<sup>651</sup>

205. The supply of events implied by my "flat trend" projection is quite conservative: As seen in Figure 2 below, the projected industrywide supply of Live MMA Events featuring Headliners as of 2016 is 108 events, which would still be below the supply of such events in prior years. Under the "flat trend" projection, total industry revenue would reach approximately \$1 billion by 2016. Even in the actual world, with the Challenged Conduct restricting output, Zuffa's current owners projected in 2016 that Zuffa's revenue alone would exceed [REDACTED] [REDACTED]

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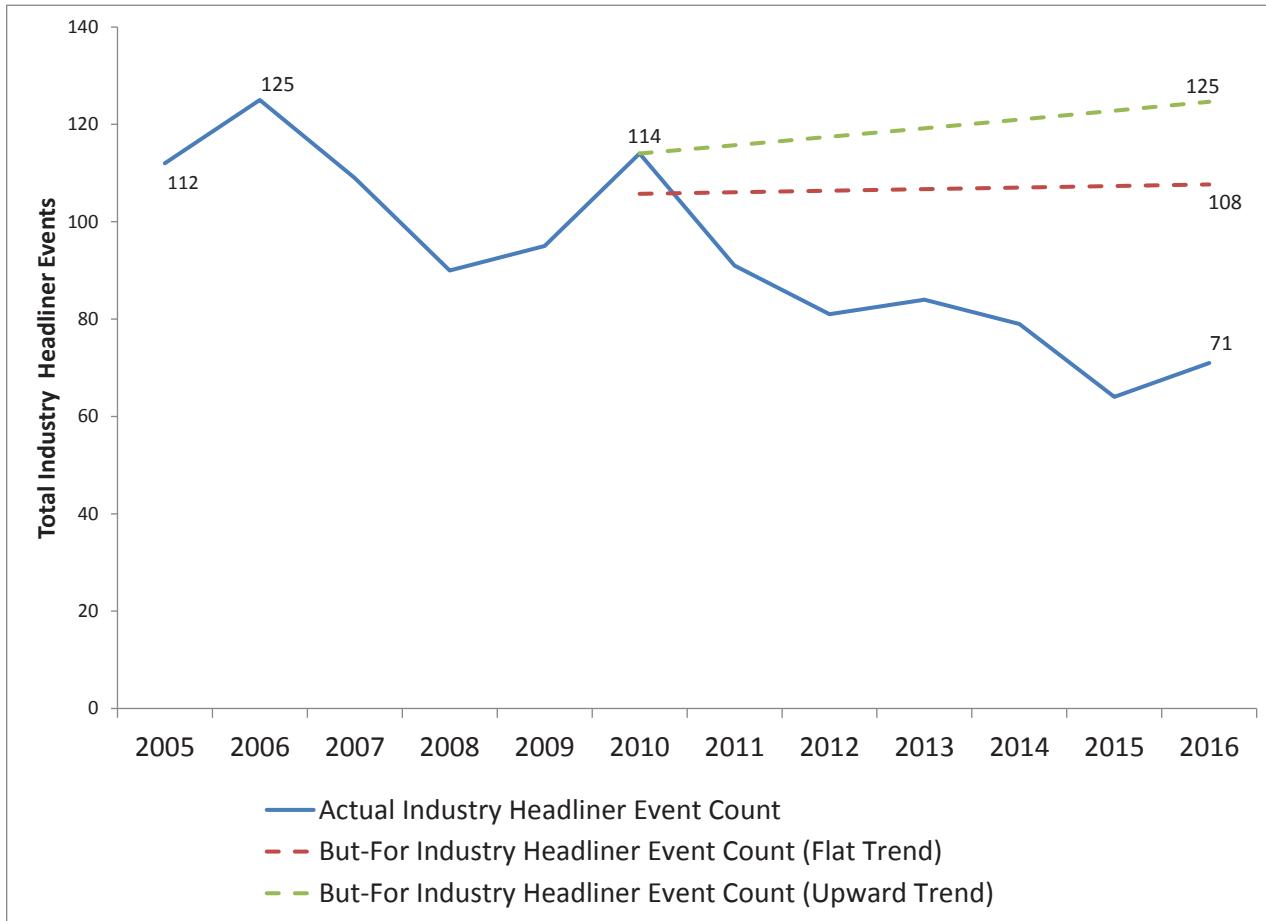
remained essentially constant during the Class Period in the but-for world. I then estimated the per-event revenue that would have been earned on these Live MMA Events using the available revenue data produced by Zuffa, Strikeforce, Bellator, and WSOF. For each year during the Class Period, I calculated the average revenue per event as the total Event Revenue earned across these four promoters, divided by the total number of events actually supplied by these four promoters. I then estimated but-for industry revenue by multiplying this average revenue per event by the total number of projected events in the but-for world.

650. Singer Report, Table 11.

651. This conclusion holds even if I allow for the possibility that the average price of Live MMA Events would have been significantly lower in the but-for world. For example, if the average revenue per Live MMA Event had been 20 percent lower in the but-for world than in the actual world, then total payments to the Bout Class would come to 54 percent of projected industry revenue (equal to \$2.2 billion / [\$5.1 billion x 0.8]). Moreover, it is likely that demand for Live MMA Events would have shifted out in the but-for world, as increased labor mobility would have allowed talent to flow more freely to the highest-valued matchups, similar to the experience of other professional sports. Singer Report ¶286-290. Thus, although consumer welfare would have been higher in the but-for world, it is not necessarily the case that the average revenue per event would have been substantially lower than in the actual world. Put differently, it is not clear that the average revenue per Live MMA Event featuring Headliners would have been lower in the but-for world, given the potential for higher-value matchups in the but-for world than in the actual world.

652. WME\_ZUFFA\_00001150, slide 5.

FIGURE 2: ACTUAL AND PROJECTED ANNUAL INDUSTRY SUPPLY OF  
LIVE MMA EVENTS FEATURING HEADLINERS



206. Alternatively, if I assume that the total supply of events featuring Headliners would have increased by just 1.5 percent per year<sup>653</sup> during the Class Period, I estimate that industry Event Revenue would have increased by \$2.1 billion during the Class Period, relative to the actual world, resulting in total industry Event Revenue of \$5.8 billion during the Class Period.<sup>654</sup> As before, there would have been more than enough Event Revenue in the but-for world to cover the \$1.6 billion from my best damages estimate: Zuffa's actual payments to the Bout Class during the

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653. [REDACTED]

654. See Appendix Table A5.

Class Period came to [REDACTED] = \$620 million.<sup>655</sup> In the but-for world, total payments to the Bout Class would have been \$620 million + \$1.6 billion = \$2.2 billion. This comes to approximately 38 percent of total but-for industry event revenue (equal to \$2.2 billion / \$5.8 billion).<sup>656</sup>

207. The supply of events implied by my “upward trend” projection is also conservative. As seen in Figure 2 above, the total industry supply of Live MMA Events featuring Headliners would be 125 events as of 2016; this is the same as the industrywide supply of such events in 2006. Before 2016, the projected supply is even lower.<sup>657</sup> Under the “upward trend” projection, total industry revenue would reach approximately \$1.2 billion by 2016.<sup>658</sup> Even in the actual world, with the Challenged Conduct restricting output, [REDACTED]

[REDACTED] .<sup>659</sup>

208. Moreover, Zuffa’s owners sold most of their stake in the UFC in 2016 for approximately \$4 billion, and sold the remainder in 2017 in a deal that valued the UFC at \$5 billion.<sup>660</sup> This indicates that a rational firm would have been willing to borrow or raise capital in order to spend more on Fighters so as to grow a business that could one day sell for that amount of

655. Singer Report, Table 11.

656. As before, this conclusion holds even if I allow for the possibility that the average price of Live MMA Events would have been significantly lower in the but-for world. For example, if the average revenue per Live MMA Event had been 20 percent lower in the but-for world than in the actual world, then total payments to the Bout Class would come to 48 percent of projected industry revenue (equal to \$2.2 billion / [\$5.8 billion x 0.8]). Moreover, as explained above, it is unclear whether the average revenue per Live MMA Event featuring Headliners would have been lower in the but-for world, given the potential for higher-value matchups in the but-for world than in the actual world.

657. To maintain consistency with my prior damages calculations, I project but-for revenues through June 30, 2017. However, I conservatively assume that the but-for supply of events does not increase in 2017, relative to 2016. Thus, the projected but-for industry Event Revenue for the first half of 2017 is equal to one half of the projected Event Revenue for all of 2016. See Appendix Table A5.

658. See Appendix Table A5.

659. WME\_ZUFFA\_00001150, slide 5.

660. Noah Kirsch, Exclusive: Billionaire Fertitta Brothers Sell Remaining UFC Stakes At \$5 Billion Valuation, FORBES, Sept. 7, 2017, available at: <https://www.forbes.com/sites/noahkirsch/2017/09/07/exclusive-billionaire-fertitta-brothers-sell-remaining-ufc-stakes-at-5-billion-valuation>.

money. All of my damages estimates fall well below the acquisition price paid for Zuffa by WME-IMG. Thus, on the day that they sold (most of) the company in 2016, Zuffa's former owners could have paid Fighters the full amount of my best damages estimate, and still walked away with \$4.0 billion - \$1.6 billion = \$2.4 billion in 2016 (not including the approximately \$290 million that Zuffa's owners received for their remaining equity in 2017).<sup>661</sup>

209. Ms. Davis, Zuffa's accounting expert, opines that "if Zuffa had a cost structure that reflected athlete compensation at the levels argued by Dr. Zimbalist and Dr. Singer, it is not certain that Zuffa would have been acquired at the same price, or at all, in 2016."<sup>662</sup> But neither Ms. Davis nor any of Zuffa's other economists provide any evidence that this purported reduction in Zuffa's valuation (if any) would have been economically significant. And even if Zuffa had sold for significantly below the \$4 billion to \$5 billion valuation it achieved in the actual world, the acquisition price could still easily have exceeded my \$1.6 billion damages estimate. Again, none of Zuffa's economists provides any evidence to the contrary.

#### **V. ZUFFA'S CLAIMED EFFICIENCY JUSTIFICATIONS FOR THE CHALLENGED CONDUCT ARE WITHOUT MERIT**

210. My initial report reviewed various efficiency defenses of some or all of the Challenged Conduct that Zuffa, or economists acting on its behalf, had proffered in past proceedings, and explained that these prior efficiency defenses were unavailing.<sup>663</sup> As explained below, many of the efficiency justifications offered by Zuffa's economists in the current proceeding are the same or similar to those used in prior proceedings, and are wrong for the same

661. In 2017, Frank and Lorenzo Fertitta sold their remaining 5.8 percent stake in the UFC in a new deal that valued the UFC at approximately \$5 billion, implying a sales price of approximately [5.8%]\*[\$5 billion] = \$290 million. *Id.*

662. Davis Report ¶114.

663. Singer Report ¶¶257-285.

or similar reasons. To the extent that Zuffa's economists have presented new efficiency justifications here for the first time, they are equally unavailing. Moreover, Zuffa's economists make no effort to quantify the purported procompetitive benefits of the Challenged Conduct (if any). This is a critical deficiency because the factfinder cannot balance any purported efficiencies against the demonstrable harm that I have calculated to Class Members as well as the additional anticompetitive effects I have demonstrated in terms of reduced output of MMA events and higher prices.<sup>664</sup>

211. The efficiency defenses put forth by Zuffa's economists amount to the claim that, in essence, Zuffa should be permitted to exercise monopsony power for the good of the sport. It bears emphasis that my initial report anticipates such claims, which echo the historical claims of professional sports owners, attempting to justify labor-market restrictions on athletes by claiming that they were necessary to incentivize investment for the benefit of the sport.<sup>665</sup> But the evidence from introducing free agency and enhanced athlete mobility into other professional sports, and the extensive sports economics literature, indicate just the opposite: Removing the restraints on Fighters imposed by the Challenged Conduct would likely benefit Fighters, fans, and the industry as a whole.<sup>666</sup> Significantly, Zuffa's economists—one of whom (Dr. Blair) is a sports economist—make no attempt to rebut this extensive evidence.

**A. Dr. Topel Provides No Evidence That the Challenged Conduct Increased Investments in Fighters Specifically or MMA Generally**

212. Dr. Topel claims that the Challenged Conduct resulted in higher investment in Fighters specifically and MMA generally:

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664. *Id.* Part III.D.4-5; see also Part I.B.3, *supra*.

665. Singer Report ¶¶286-290.

666. *Id.*

Zuffa's challenged contractual provisions are procompetitive....The contract provisions are efficient and procompetitive responses to contracting externalities and transactions costs that would otherwise hinder promoters' investments in the quality and marketability of MMA fighters and events. These provisions have been instrumental in developing MMA as a successful sports market.<sup>667</sup>

As explained below, Dr. Topel provides no evidence demonstrating that the Challenged Conduct enhanced investment, nor any analysis quantifying the extent to which investment in Fighters or MMA would be reduced in the absence of the Challenged Conduct. Dr. Topel also fails to provide any evidence of the purported "transactions costs"<sup>668</sup> supposedly overcome by the Challenged Conduct. Finally, Dr. Topel ignores the clear economic incentives that Fighters would have faced in the but-for world to use the proceeds from their elevated compensation to invest in their own promotion, training, and human capital.

#### **1. Dr. Topel Provides No Evidence That the Challenged Conduct Enhanced Investment**

213. Dr. Topel admits that the Challenged Conduct permits Zuffa to exercise monopsony power: Dr. Topel concedes that, in the absence of the Challenged Conduct, "a potential competitor could recruit and contract with the existing stock of developed Zuffa athletes,"<sup>669</sup> resulting in a "transfer of wealth to the stock of existing Zuffa athletes[.]"<sup>670</sup> Thus, removal of the Challenged Conduct would cause Zuffa to pay its Fighters more (or lose them to other promoters) by making the labor market more competitive. This amounts to a concession by Dr. Topel that the Challenged Conduct constitutes an exercise of Zuffa's monopsony power to suppress Fighters' compensation. Dr. Topel is left to claim, without evidence, that these benefits to Fighters would be transitory because removal of the Challenged Conduct would result in lower investment in MMA over the

667. Topel Report ¶25.

668. *Id.*

669. *Id.* ¶68.

670. *Id.*

long run.<sup>671</sup> As explained below, Dr. Topel has no hard evidence to support his claim, while the evidence against it is extensive.<sup>672</sup>

214. Dr. Topel claims that the Challenged Conduct “assist[s] in protecting promoters’ investments and building a business”<sup>673</sup> by preventing so-called “free-riding.”<sup>674</sup> In economics, free riding refers to the ability of one party to capture the returns to investments made by another party, which can discourage future investment.<sup>675</sup> But economists and antitrust authorities recognize that, although a dominant firm itself may benefit from preventing free riding, competition overall may be harmed if “the conduct simultaneously raises the costs of competitors or barriers to entry or expansion.”<sup>676</sup> For this reason, the claimed efficiencies must be weighed against the anticompetitive harms, in a “balancing of probabilities [that] is carried out in the rule of reason analysis.”<sup>677</sup> My initial report does just that, demonstrating that the net effect of the Challenged Conduct was to harm competition in myriad ways.<sup>678</sup>

215. In contrast, Dr. Topel provides no evidence whatsoever quantifying the purported procompetitive benefits of eliminating free riding, nor does he even attempt to show that these

671. Topel Report ¶68.

672. Singer Report Part III; *id.* ¶¶286-290. Dr. Topel admitted in his deposition that elimination of the reserve clause increased compensation to professional baseball players because “property rights were transferred from the team to the players.” Topel Dep. at 140:19-22. Dr. A. Blair agrees that the demise of the reserve system and the advent of competition through free agency led to a dramatic increase in the salaries of professional baseball players. Blair Dep. at 37:14-17; Dr. Blair agrees that the reserve system transferred wealth from the players to the owners, by giving the owners a property right in the players’ contracts. *Id.* at 98:22-99:7.

673. Topel Report ¶¶85-89.

674. *Id.* ¶¶85-89.

675. Modern IO at 414.

676. Salop (2017) at 378.

677. *Id.* Moreover, “[w]hen exclusivity is instituted by a monopolist against all of its competitors,” as is the case here, “there is a greater likelihood that the harms dominate the benefits.” *Id.* at 396. See also PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION, ¶ 737 (4<sup>th</sup> ed. 2017) (“a firm’s conduct might consist largely of ordinary business practices, yet be highly exclusionary because of the industry structure and the firm’s market power.... [B]ehavior that is rational for a firm with little or no market power may nevertheless produce substantial and unnecessary anticompetitive effects when wielded by a firm with considerable market clout”).

678. Singer Report Part III.

speculative procompetitive benefits outweigh the harms of the Challenged Conduct, including the harms that Dr. Topel himself identifies (namely, reduced Fighter compensation). Dr. Topel's expert report contains no evidence or analysis demonstrating that investment in MMA generally or in Fighters specifically would have been lower in a but-for world without the Challenged Conduct.<sup>679</sup>

216. In his deposition, Dr. Topel admitted that he made no effort to calculate the extent to which "investment in athletes" would decline if the challenged contractual provisions were eliminated.<sup>680</sup> Similarly, Dr. Topel admitted that he made no calculations of the extent to which promotion of MMA generally would decline in the absence of the Challenged Conduct.<sup>681</sup> Dr. Topel also conceded that Zuffa invested resources in helping to grow the sport of MMA and in promoting MMA athletes in the early 2000s, despite a lack of "evident market power,"<sup>682</sup> and despite "contracts of shorter duration."<sup>683</sup> Dr. Topel further acknowledged that absent the Challenged Conduct, Zuffa would still have made some investment in the show Ultimate Fighter;<sup>684</sup> that he made no effort to calculate the extent of his claimed investment reductions associated with the removal of the Challenged Conduct; that he did not calculate the claimed impact of the Challenged Conduct on promotion generally or on Zuffa's investment in Fighters;<sup>685</sup>

679. Part V.B of Dr. Topel's report, titled "Exclusivity and Multi-Bout Contracts Assist in Protecting Promoters' Investments and Building a Business," is devoid of record evidence, or any evidence specific to Zuffa or MMA; it includes only a general discussion of free riding in the economic literature.

680. Topel Dep. at 150:1-12 ("Q. You don't in your report quantify the total amount of promotional investment in athletes that you believe would be lost if the challenged contractual provisions were eliminated, do you? A. You mean do I have a dollar amount on it? Q. Correct. A. We didn't put a dollar amount, no.").

681. *Id.* at 153:18-25 ("Q. Can you show me a table in your report where you quantify the amount of promotional dollars that – I'm sorry – the amount of additional promotional dollars that would be lost in either of those two but-for worlds? Is there a table in your report where I can find that? A. No. That's not part of my analysis or part of my opinions.").

682. *Id.* at 330:24-331:7.

683. *Id.* at 331:8-10.

684. *Id.* at 148:20-24.

685. *Id.* at 153:18-25.

that he did not compute the claimed amount of lost Event Revenue, if any, absent the Challenged Conduct;<sup>686</sup> that he did not compute the claimed reduction in output, if any, that would be caused by any purported increase in transactions costs in the but-for world;<sup>687</sup> and that he did not compute the claimed increase in output, if any, attributable to the purported reduction in transactions costs associated with the restrictive fighter contracts.<sup>688</sup>

217. Dr. Topel also ignores the clear economic incentives that Fighters would have had in the but-for world to use the proceeds from their elevated compensation to invest in their own promotion and human capital. This result is supported by economic studies of non-compete clauses in employment contracts. Some employers have attempted to justify non-compete clauses in contracts with employees on the grounds that they prevent workers from free-riding on firms' investments in workers' specialized skills. But empirical studies have found that banning non-compete clauses on balance does not reduce innovation or investment in employees' human capital. To the contrary, contracts that prevent locked-in workers from taking their developed talents to a rival can discourage employees from investing in their own human capital; when these restrictions on worker mobility are lifted, workers can capture more of the returns to their own human capital investments. This literature indicates that the overall effect of restraints on worker mobility is a *reduction* in human capital investment.<sup>689</sup> In other words, what this literature suggests

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686. *Id.* at 163:23-164:1.

687. *Id.* at 165:23-166:2.

688. *Id.* at 168:2-7.

689. One study, which compares Silicon Valley to Boston's Route 128 technology district, found that Silicon Valley performed well due to the greater employee movement allowed in California, while in Massachusetts, enforcement of non-compete clauses restricted labor mobility and chilled innovation. See Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not To Compete*, 74 NEW YORK UNIV. L. R. 575 (Jun. 1999). Another study used both a time series analysis of states that changed their enforcement of non-compete clauses, as well as a cross-sectional analysis comparing states with enforcement of non-competes to states without. That study found that low-enforcement jurisdictions (those with greater labor mobility) had higher investment, as measured both by R&D investment, and capital-intensity of production. Mark J. Garmaise, *Ties*

is that, with enhanced Fighter mobility absent the Challenged Conduct, even if one assumes that MMA promoters would have less of an incentive to spend money promoting Fighters, the Fighters themselves would likely have faced equally powerful (or even greater) incentives to use their increased compensation to invest in their own human capital, thereby—when considered alongside likely increases in rival MMA promoters’ spending as well as newfound co-promotion—replacing or exceeding any loss in promotional spending by Zuffa in the but-for world. In his deposition, Dr. Topel admitted that Fighters expend resources in their own promotion,<sup>690</sup> and that such expenditures could rise if Fighter compensation were to rise by \$1.6 billion (the amount of aggregate damages quantified in my initial report).<sup>691</sup> Again, Dr. Topel provides no evidence that, absent the Challenged Conduct, there would have been less investment in the development of MMA or in its Fighters.

218. In his report, Dr. Topel refers to deposition testimony from UFC’s Assistant General Counsel Michael Mersch, claiming that “contractual exclusivity was important to allowing a promotion ‘to maximize and to promote that fighter as a way of building the stature and notoriety of the fighter[.]’”<sup>692</sup> Dr. Topel also references similar deposition testimony from WSOF CEO Carlos Silva, stating that “one of the benefits of having exclusive, multi-fight contracts that you

*that Truly Bind: Non-competition Agreements, Executive Compensation and Firm Investment*, 27 J. OF LAW, ECON. AND ORG. 376 (Aug. 2011). Another study empirically tested the free-rider hypothesis by measuring the effect of marginal dollar of venture capital investment on patent filings, new business establishments, and job creation. The authors found that states that enforce non-competes experience a lower return on venture capital investment than states that proscribe enforcement. See Sampsaa Samila & Olav Sorenson, *Noncompete Covenants: Incentives to Innovate or Impediments to Growth*, 57 MANAGEMENT SCIENCE 425-38 (2011). See also Omri Ben-Shahar, *California Got It Right: Ban The Non-Compete Agreements*, FORBES, Oct. 27, 2016 (“The evidence confirms that firms invest more in R&D and in worker development when their investment is protected by the non-compete clauses. But it also shows that workers who are locked-in invest less in self-training, and that this effect is dominant. Put simply, restraints on workers’ mobility reduce overall investment in human capital.”), available at <https://www.forbes.com/sites/omribenshahar/2016/10/27/california-got-it-right-ban-the-non-compete-agreements>.

690. Topel Dep. at 154:15-20; *see also id.* at 279:5-9.

691. *Id.* at 157:5-16.

692. Topel Report at ¶68 (citing Deposition of Michael Mersch, (July 14, 2017), at 164-165).

can see a return on investment when you invest with a fighter and you have some time with them to build them up.”<sup>693</sup> This testimony does not quantify the procompetitive benefits (if any) of exclusive contracts of the type Zuffa has employed during the Class Period, let alone establish that these purported benefits outweigh the anticompetitive harm generated by the Challenged Conduct. It also fails to establish whether or the extent to which any of these speculative, unquantified efficiencies would be lost if the Challenged Conduct were removed, given that multi-bout contracts could still exist in the but-for world (so long as their duration was sufficiently short and other restrictions on mobility were eliminated), as explained in Part V.C.3 below.

219. Dr. Topel also references the Fighter contracts of other MMA promoters such as Bellator.<sup>694</sup> Because other MMA promoters have sometimes followed Zuffa’s lead by including some provisions similar to the Challenged Conduct in their own Fighter contracts, Dr. Topel claims that the Challenged Conduct is procompetitive.<sup>695</sup> Notwithstanding the fact that a smaller rival’s strategic response to exclusionary conduct might involve strategically copying the exclusion, which renders this a tainted benchmark, this evidence does not quantify the procompetitive benefits of the Challenged Conduct (if any), let alone establish that these purported benefits outweigh the anticompetitive harm generated by the Challenged Conduct. Again, this evidence fails to establish whether or the extent to which any of the speculative efficiencies would be lost if the Challenged Conduct were removed. As before, Dr. Topel provides no analysis of other MMA promoters’ investments in Fighters specifically or MMA generally, and offers no evidence that other MMA promoters’ investments would be lower in the but-for world without the Challenged Conduct. In addition, the general claim that a dominant firm’s conduct can be justified

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693. *Id.* (citing Deposition of Carlos Silva, April 18, 2017, at 196-97).

694. *Id.* ¶¶83-84.

695. *Id.*

as procompetitive because similar conduct is sometimes undertaken by smaller rivals is wrong as a matter of economics and antitrust, as explained Part V.C below.

220. Dr. Topel's free-rider justification for the Challenged Conduct is also undermined by the fact that Zuffa does not invest particularly intensively in Fighters' human capital, but instead itself free rides on investments by "minor league" promoters and the fighters themselves. Jeffrey Aronson, CEO of Titan, testified that the UFC was not interested in promoting fighters "very early in development" and thus fighters needed to build a record elsewhere before having a chance at the UFC.<sup>696</sup> Joe Silva, Zuffa's lead matchmaker, testified similarly that fighters needed to have a demonstrated record of success at other promotions in order to get a UFC contract.<sup>697</sup> In addition, as I explained in my opening report, Zuffa does not invest in fighter training; instead fighters are expected to cover those costs themselves.<sup>698</sup> Dr. Topel admitted in his deposition that he did not quantify the amount that Zuffa spent on promoting fighters, or any fighter in particular,<sup>699</sup> nor did he quantify Zuffa's promotion of its own brand as opposed to promoting its Fighters.<sup>700</sup>

## **2. Dr. Topel Provides No Evidence of Purported "Transactions Costs," Which Have Not Prevented Co-Promotion in MMA or Boxing, or Competitive Matchups in Non-Combat Sports**

221. Dr. Topel claims that the Challenged Conduct reduces the "substantial transaction costs associated with setting up and promoting interest in MMA."<sup>701</sup> Yet he provides not a single estimate of the magnitude of these purported transactions costs, and provides no record evidence of

696. Deposition of Jeffrey Aronson, April 25, 2017, at 28:20-24 [hereafter "Aronson Dep."] See also *Id.* at 26:13-18 ("The problem is the UFC is typically not looking for a kid who is 2-0 or 3-0, so they have to fight. It has become an epidemic. I started talking to other managers in the field and everybody has the same problems.").

697. Silva Dep. at 114:13-119:15.

698. Singer Report ¶21, n.36.

699. Topel Dep. at 149:7-22.

700. *Id.* at 150:13-24.

701. Topel Report ¶90.

their supposed economic significance. As explained below, record evidence indicates that MMA promoters, including Zuffa, are willing to co-promote, and do co-promote, in circumstances in which they lack substantial market power. Such co-promotion would not occur if the transactions costs of co-promotion were prohibitive, as Dr. Topel claims. On the other hand, Zuffa faces clear incentives not to co-promote in the actual world: Doing so would undermine the effect of the Challenged Conduct, which is to foreclose Zuffa's rivals from a key input necessary to compete effectively.<sup>702</sup> For Zuffa, engaging in co-promotion would risk allowing a rival promoter to gain "traction" by being associated with successful Live MMA Events.<sup>703</sup> Given that Zuffa's refusal to co-promote cannot be explained by purported transactions costs, but can be explained the Challenged Conduct, it is reasonable to infer that co-promotion likely would be employed by Zuffa (and other MMA promoters) in the but-for world.<sup>704</sup>

222. Dr. Topel speculates that Zuffa's contracts restricting athlete mobility and Zuffa's horizontal acquisitions permitting Zuffa to control a deep roster of high-ranked fighters, has allowed Zuffa to avoid the purported transactions costs associated with two MMA organizations promoting a shared MMA event.<sup>705</sup> As demonstrated below, co-promotion is common in the MMA industry among smaller promoters that lack Zuffa's market power, as well as in boxing. Indeed,

702. Singer Report Part III.C; *see also* Part I.C, *supra*.

703. See, e.g., Silva Dep. at 216:21-217:5; Silva Exh. 16 (admitting Zuffa does not copromote with Bellator because "if you gave Alvarez the shot and Henderson slipped on a banana peel and lost you will have given Bellator the greatest Christmas present of all: Bellator's champ would jump from number ten to number one. Even just giving their former champion an immediate title shot puts Bellator on a level they don't deserve.").

704. It bears noting that, although co-promotion would likely have occurred more frequently in the but-for world, co-promotion is not necessary to effectuate more competitive compensation outcomes in the but-for world. What matters is that, in the but-for world, rivals would be able to attract a critical mass of Fighters and thus be capable of competing effectively with Zuffa. This could occur without increased co-promotion. For example, if a rival promoter could lure (say) the even-numbered-ranked fighters from Zuffa, this might suffice to give the rival the necessary critical mass.

705. Topel Report ¶95 ("Inherent to this solution to the transaction cost issue is that the marketplace will rely on matches between athletes contracted to the same promoter. Co-promoted matches, in which athletes from different MMA promoters compete against one another, are apparently non-existent.").

Zuffa itself expressed interest in co-promotion with MMA rivals before it acquired the degree of market power that it possessed during the Class Period, and still co-promotes events with boxing promoters—that is, in a market in which it lacks market power. If the transactions costs associated with co-promotion were prohibitive, as Dr. Topel contends, one would not expect to see so many examples of co-promotion in the sport. That we observe it so frequently implies that either the transactions costs are low or the benefits of co-promotion exceed the (manageable) transactions costs. In light of the frequency with which non-Zuffa MMA promoters co-promote, it is curious that Topel would describe co-promotion as “apparently non-existent” in MMA.<sup>706</sup>

223. Other MMA promoters historically and currently use co-promotion to expand the demand for their events. In 2009, Scott Coker, then-president of Strikeforce, predicted that Strikeforce would “be in Japan doing a co-promotion [with DREAM] in relatively short time.”<sup>707</sup> Coker explained in 2010 that “The way our company philosophy has always promoted or it has not been afraid of *co-promoting*. We did it when we got into the business in mixed martial arts with, at the time, EliteXC. We’ve done it with M-1. We’ve done it with Dream.”<sup>708</sup> In the same year,

706. *Id.*

707. John Morgan, “Strikeforce CEO Scott Coker Predicts Dream Co-Promotion in Relatively Short Time,” *MMA Junkie* (Aug. 17, 2009), available at <http://mmajunkie.com/2009/08/strikeforce-ceo-scott-coker-predicts-dream-co-promotion-in-relatively-short-time>.

708. *Scott Coker Talks Co-Promotion and Negotiations with Fedor, But is Conspicuously Mum About CBS Negotiations*, CAGE POTATO, (undated), available at <http://www.cagepotato.com/scott-coker-talks-co-promotion-and-negotiations-fedor-conspicuously-mum-about-cbs-negotiations/> (emphasis added). See also Jon Show, *Strikeforce builds a following in the shadows of the UFC*, SPORTS BUSINESS JOURNAL, Oct. 12, 2009 (“While the UFC will not co-promote fights, Strikeforce has gained access to highly ranked fighters through co-promotion deals with smaller domestic and international organizations that have one or two fighters but not the financial resources to compete with UFC.”); ZUF-00031973 (The Business of Mixed Marital Arts; Investing in the World’s Fastest Growing Sport, Emerging Growth Research LLP, Oct. 27, 2008, at 18) (“An additional factor contributing to the success of Strikeforce is its willingness to co-promote with other MMA organizations in order to put on the best fight cards possible. Many who follow the business of mixed martial arts consider Strikeforce to be one of the best managed and financially backed organizations in the industry.”). Deposition of Scott Coker, Aug 3, 2017, at 32 (“Q. During the period from 2006 to the time of the sale of Strikeforce in March of 2011, did Strikeforce allow fighters to fight for other MMA promotions, that is, promotions other than Strikeforce? A. Yes. Q. And those were fighters that were under contract with Strikeforce? A. Yes.”); *id.* at 34 (“Did the fact that fighters under contract with Strikeforce fought for other promotions, did that impair Strikeforce’s ability to do its business in any way? A. No.”).

Coker expressed a willingness to co-promote a fight with Bellator, featuring two of the world's top 155-pound fighters.<sup>709</sup> To land Fedor Emelianenko, Strikeforce reportedly had to permit the Russian star's M-1 Global promotion to co-promote events with Strikeforce.<sup>710</sup> In November 2011, One FC of Singapore announced that it had entered a partnership with leading Japanese promoter Dream.<sup>711</sup> In January 2012, ProElite MMA and DREAM announced the initiation of a promotional partnership and fighter exchange program.<sup>712</sup> In December 2016, Bellator 169 was a co-promotion with UK-based BAMMA.<sup>713</sup> Coker explained in May 2017 that the most logical way for Bellator to compete in Poland was to co-promote with Poland's KSW.<sup>714</sup> In a November 2017 letter to Congress, Bellator testified that it "frequently *co-promotes* events with smaller domestic local promoters and international fight promoters to enhance our events and allow them opportunities to showcase their league talent."<sup>715</sup> Similarly, Mr. Aronson of Titan FC testified that if Bellator or "World Series [of Fighting] wanted to put one of their fighters against a Titan fighter, I'd be all for it."<sup>716</sup>

224. Prior to securing the degree of monopsony power it possessed during the Class Period, Zuffa itself entertained the concept of co-promotion. In Dana White's first interview after

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709. Nick Thomas, *Strikeforce open to Bellator co-promotion, Gilbert Melendez vs. Eddie Alvarez: A potential fight*, BLOODY ELBOW (May 17, 2010), available at <https://www.bloodyelbow.com/2010/5/17/1476096/strikeforce-open-to-bellator-co>.

710. *Strikeforce CEO Coker Sees Endless Possibilities*, LAS VEGAS SUN, Aug. 18, 2009, available at <https://lasvegassun.com/news/2009/aug/18/strikeforce-ceo-coker-sees-endless-possibilities/>.

711. *Dream, One FC Form Alliance, Plan March 31 Co-Promotion*, SHERDOG, Nov. 28, 2011, available at <http://www.sherdog.com/news/news/Dream-One-FC-Form-Alliance-Plan-March-31-CoPromotion-37500>.

712. *ProElite and DREAM form new promotional partnership and fighter exchange program*, MMA MANIA, Jan. 18, 2012, available at <https://www.mmamania.com/2012/1/18/2715790/proelite-dream-co-promotion-partnership-ufc>.

713. *An Olympic gold medallist, 'King Mo' and a big night in Dublin for Irish MMA*, THE 42, Dec. 16, 2016, available at <http://www.the42.ie/bellator-169-bamma-27-preview-3141650-Dec2016/>.

714. Jim Edwards, *Scott Coker Talks Bellator Going to Ireland, Poland, Brazil, KSW and ACB*, CREATORS.CO, May 18, 2017, available at <https://champions.co/p/scott-coker-talks-bellator-ireland-poland-brazil-ksw-acb/4272912>.

715. Bellator letter to Congress re Ali Act (Testimony of Tracey Lesetar-Smith Bellator MMA <http://docs.house.gov/meetings/IF/IF17/20171109/106604/HHRG-115-IF17-20171109-SD011.pdf> (emphasis added).

716. Aronson Dep. at 58:3-22.

becoming president of Zuffa, he explained that “And my main goal, the main guy I want to get together with. Even if I have to *co-promote* with PRIDE, and we don’t have a problem with co-promoting, they do it in boxing...”<sup>717</sup> White even intimated that the transactions costs would be insignificant: “Yukino and PRIDE really want Tito. And we really want Sakuraba. So I don’t see why we can’t work something out. I enjoy working with PRIDE. I respect them, so I don’t see a problem.”<sup>718</sup> In 2003, the UFC permitted Chuck Liddell to fight in PRIDE, with the idea that Liddell would defeat Pride’s stars, and return with the PRIDE Title.<sup>719</sup> UFC’s Carlos Newton went back and forth between PRIDE and UFC between 1998 and 2004.<sup>720</sup>

225. Finally, MMA promoters have allowed Fighters to compete in non-MMA promotions. In 2015, Bellator’s Joe Schilling signed a new deal with kickboxing promoter GLORY.<sup>721</sup> As head of Bellator, Coker permitted one of his MMA fighters, Michael “Venom” Page, to participate in a boxing match in London in 2017.<sup>722</sup> In July 2017, Bellator reportedly allowed Michael Page to compete in boxing to help keep his skills sharp while preparing for his

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717. Dana White UFC President Interview, Interview by Tony Rojas, (undated), available at <http://www.primetimefighters.net/interview2.htm> (emphasis added).

718. *Id.*

719. DIRECTV Interview with Dana White (undated), available at [http://www.directv.com/see/landing/pride\\_interview.html](http://www.directv.com/see/landing/pride_interview.html).

720. Carlos Newton “The Ronin,” Mixed Martial Arts, (undated), available at <http://www.mixedmartialarts.com/fighter/Carlos-Newton:AF8B7F51248A75F7>.

721. Mike Bohn, *Bellator’s Joe Schilling signs with GLORY, plans kickboxing and MMA in 2015*, MMA JUNKIE, Jan. 7, 2015, available at <http://mmajunkie.com/2015/01/bellators-joe-schilling-signs-with-glory-plans-kickboxing-and-mma-in-2015>.

722. Scott Coker open to five-round main events, *Michael Page vs. Paul Daley ‘winner takes all’ match*, PRIMAL FIGHT LEAGUE, Oct. 24, 2017, available at <https://primalfightleague.com/scott-coker-open-to-five-round-main-events-michael-page-vs-paul-daley-winner-takes-all-match/>.

next MMA bout.<sup>723</sup> In 2017, Zuffa co-promoted a boxing match featuring MMA fighter Conor McGregor.<sup>724</sup>

226. Co-promotion is also a common practice in boxing.<sup>725</sup> Dr. Topel provides no evidence that the purported “transactions costs” of co-promotion should be prohibitive for MMA, yet insignificant for boxing. Dr. Topel claims that the lack of “independent sanctioning organizations”<sup>726</sup> to “negotiat[e] matches between athletes”<sup>727</sup> explains why co-promotion is common in boxing but not MMA; according to Dr. Topel, MMA lacks an “independent arbiter ...that can resolve the disparate incentives...and ensure that beneficial matches will take place.”<sup>728</sup> This opinion is devoid of economic content; in reality, economic theory predicts that two promoters face clear economic incentives to combine Fighters in the most valuable matchups, with or without an independent sanctioning organization.<sup>729</sup> This prediction is borne out by the evidence

723. Shaun Al-Shatti, *Scott Coker: Paul Daley vs. Michael Page planned for early 2018, ‘MVP’ to box in interim*, MMA FIGHTING, July 4, 2017, available at <https://www.mmafighting.com/2017/7/4/15882564/scott-coker-paul-daley-vs-michael-page-planned-for-early-2018-mvp-to-box-in-interim>.

724. Trent Reinsmith, *UFC’s Dana White Says Floyd Mayweather-Conor McGregor Boxing Match Sold 6.7 Million PPVs*, FORBES, Oct. 25, 2017, available at <https://www.forbes.com/sites/trentreinsmith/2017/10/25/ufc-president-dana-white-says-floyd-mayweather-vs-conor-mcgregor-boxing-match-sold-6-7-million-ppv/>.

725. Deposition of Leon Margules, July 11, 2017, at 25:20-26:5 (“Q. Is co-promotion common in the boxing world? A. Very common. More so today than it used to be, but, yes, very common. Q. Of the championship events that Warriors Boxing promoted, what percentage would you estimate involved co-promotion with another promoter? A. Most. Not all, but most.”); *id.* at 117:9-18 (“Why do boxing promoters agree to co-promote fights with each other? A. Because television wants to buy, or the fans have interest in a particular matchup, and the two fighters have different promoters. Or because two promoters get together and say if we work together we can stage this event and be successful.”). See also Deposition of Louis John Dibella, Aug. 29, 2017, at 44:16-45:12 (“Q. Does co-promotion allow events to occur in boxing that otherwise would not? A. Yeah, but it’s . . . literally a necessity when you get into things like mandatory contenders and rankings. You know, there’s -- the world rankings require champions to fight a ranked fighter in his organization; i.e., if he’s a WBO champion he needs to fight a WBO ranked fighter. If you have a ranked fighter, if he is 6 or 7 in the world, they elect to fight you, you are nowhere near the stature or the marketability or the value to television of the champion, so the only way you are going to get that fight is through a --and it’s not even -- sometimes -- co-promotion – it’s always a co-promotion.”); Deposition of Robert Arum, Oct. 17, 2017, at 14:23-15:2 (“Q. And does Top Rank tend to do co-promotion with its ESPN deal? A. Absolutely. Of course. Because sometimes you make the best fights by doing co-promotions.”).

726. Topel Report ¶91.

727. *Id.*

728. *Id.*

729. Indeed, in the but-for world, such independent organizations could arise, just as they did in boxing to fulfill the same role.

reviewed above, which shows that MMA promoters without market power are willing to engage in co-promotion—including Zuffa itself when it lacks market power (as illustrated by Mayweather-McGregor). More generally, it is borne out in the sports economics literature reviewed in my initial report, which shows that competitive markets produce the most compelling matchups by allowing talent to flow to its highest-valued use.<sup>730</sup> Finally, purported transactions costs clearly have not prevented teams in professional sports leagues from scheduling games against one another—year after year, season after season, in sport after sport—despite the absence of common ownership of the competing teams.

**B. Dr. Topel Fails to Demonstrate the Challenged Conduct Permitted the UFC to Succeed by Procompetitive Means**

227. My initial report demonstrates that the Challenged Conduct substantially foreclosed competition and generated substantial anticompetitive effects.<sup>731</sup> Relying heavily on anecdotes, conjecture, and language reminiscent of Zuffa’s promotional materials, as well as other unpersuasive evidence, Dr. Topel asserts that the UFC succeeded by procompetitive means.<sup>732</sup> As explained below, this claim is both unpersuasive and irrelevant. It is irrelevant because, even if his evidence of the UFC’s claimed procompetitive conduct were persuasive, Dr. Topel provides no evidence that this claimed procompetitive conduct was driven by the Challenged Conduct. He provides no evidence that the Challenged Conduct was necessary for the UFC or the sport of MMA more generally to succeed.

**1. Dr. Topel Relies on Anecdotes, Conjecture, and Other Unpersuasive Evidence to Claim that the UFC Has Succeeded by Procompetitive Means**

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730. Singer Report ¶287.

731. *Id.* Part III.

732. Topel Report Part III.

228. Dr. Topel's claim that "the UFC is a prime example of the kind of 'superior skill, foresight, and industry' that is the hallmark of vigorous competition"<sup>733</sup> relies heavily on anecdotes and conjecture, and is devoid of economic analysis.<sup>734</sup> For example, Dr. Topel points to Dana White's purported contribution to Zuffa's success, such as White's Twitter follower count and his coining of the marketing phrase "As Real As It Gets."<sup>735</sup> Dr. Topel's opinion that Zuffa has "expanded the market for MMA by evangelizing its acceptance"<sup>736</sup> is similarly devoid of economic content.

229. Dr. Topel also claims that Zuffa "expended significant resources in legitimizing MMA,"<sup>737</sup> and that Zuffa's efforts ultimately "led to MMA being sanctioned by state athletic commissions in all 50 states by 2016."<sup>738</sup> Although establishing the sequence of events that "legitimized MMA" is not a topic that lends itself to economic analysis, I understand that the rules and regulations governing MMA were already established before Zuffa purchased the UFC, that the UFC's prior owners sought and obtained sanctioning for MMA in several states, and that various MMA publications, journalists, and websites have documented Zuffa's factually incorrect claims in this regard, which are sometimes referred to collectively as the "Zuffa myth."<sup>739</sup>

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733. *Id.* ¶49 (citing Fertitta Dep. at 147).

734. *Id.* ¶¶49-57.

735. *Id.* ¶55.

736. *Id.* ¶21.

737. *Id.* ¶51.

738. *Id.*

739. See, e.g., Letter to CBS News by Nick Lembo, New Jersey Deputy Attorney General and the Counsel to the New Jersey State Athletic Control Board, available at <http://www.mmaweekly.com/new-jersey-commission-corrects-60-minutes-story-2> ("Mr. White did not set up rules and regulations for today's sport known as mixed martial arts. Simply put, the State of New Jersey did. All Mr. White did was follow rules that were already set in place... Mixed martial arts websites and publications...have done extensive articles covering Mr. White's factually incorrect statements, which have come to be known as the 'Zuffa Myth'."). See also Jonathan Snowden, "UFC 118 Preview: Dana White Brings Back the Zuffa Myth for an Ignorant Boston Press," *Bloody Elbow* (August 26, 2010) ("Zuffa has long promoted the myth that Semaphore Entertainment Group (SEG), the previous owners of the UFC, ran away from regulation while they ran towards it. White credits himself with cleaning up a dirty sport. The problem: his account is mostly fictional. SEG went to great lengths to get the sport approved in New Jersey and California (where the battle

230. In an attempt to demonstrate that the UFC's success is the result of competition on the merits, Dr. Topel claims that "the history of MMA, both for UFC and for competing promoters, shows that identifying, developing, and promoting talent is the path to success."<sup>740</sup> Instead of presenting economic analysis to support this proposition, Dr. Topel simply reviews deposition testimony of Dana White taking credit for Conor McGregor's success, and similar claims from other Zuffa executives.<sup>741</sup> Elsewhere in his report, Dr. Topel presents Exhibit 25, which he claims demonstrates that "Zuffa has a strong history of helping athletes develop from a low rank into the Top 15."<sup>742</sup> But as explained in Part I.A.1 above, Dr. Topel's Exhibit 25 simply confirms that Zuffa's share of the Headliner Submarket has increased over time. Moreover, according to Dr. Topel's own analysis in Exhibit 25, between 21 percent and 49 percent of what Dr. Topel terms "Zuffa Headliner Streaks" during the Class Period involved Fighters who achieved Headliner status *before* they came to Zuffa.<sup>743</sup> This indicates that Zuffa, despite having

raged for years). After Campbell McLaren's early marketing based around the sport's brutality backfired, the UFC went into overdrive to change the public perception of the sport. Techniques like head butts had been eliminated long before White came on the scene and eye gouges were never allowed. And even the Unified Rules used to govern MMA today came from the Mixed Martial Arts Council (MMAC) manual created by UFC Commissioner Jeff Blatnick for SEG.").

740. Topel Report ¶61.

741. *Id.* ¶¶61-63, citing Deposition of Dana White, August 9-10, 2017, at 332:17-23 ("Four years ago, Conor McGregor was available to everybody. Bellator, ONE FC, UFC, everybody out there. Do you know who went out – he was – he was 7 and 2. Okay? Guy's record was 7 and 2. There's a zillion of them, right? I went and got Conor McGregor. I saw him, I liked his personality, and I turned him into a star, one of the biggest stars on earth right now."); Silva Dep. at 61:15-23 ("[P]eople simply didn't do that research... I'm not being disingenuous. I really felt that there was talent that was overlooked. That here's the -- the fighters that people are making a big deal about, but I did not necessarily agree that they were that good, where I thought there were good fighters that may have been going under people's radar."); Deposition of Lorenzo Fertitta, March 23, 2017 at 221:13-223:5 ("I felt like we provided more value than Strikeforce as a company... So the amount of value that the UFC provided, in my mind, was significantly greater than our competition was providing.").

742. Topel Report ¶214; *id.* Exhibit 25.

743. *Id.* Exhibit 25, fourth column (displaying "% of Zuffa Headliner Streaks With Non- Headliner Rank at Time of First Ever Zuffa Bout"). This statistic ranges from 51 percent to 79 percent between 2011 and 2017. Therefore, between (1- 79) = 21 percent and (1- 51) = 49 percent of Zuffa Headliner Streaks involved Fighters that achieved Headliner status before coming to Zuffa).

foreclosed a dominant share of Headliners, still routinely relied on Headliners obtained from other promotions.

231. My own analysis confirms that Zuffa routinely relied on highly ranked Fighters acquired from other MMA promoters, either through horizontal acquisitions or by “poaching” (that is, by signing the Fighter away from another MMA promoter after the Fighter has already begun to achieve prominence). Between January 2001 and June 2017, of the 380 Headliners that have fought for Zuffa, 145 (or 38 percent) *first achieved Headliner status at another MMA promoter*. Over that same period, of the 181 top-five Fighters who have fought for Zuffa, 58 (or 32 percent) first achieved a top-five rank at another MMA promoter. Even during the Class Period (when Zuffa enjoyed a dominant share of the Headliner market), 23 percent of the Headliners who fought for Zuffa first achieved Headliner status at another MMA promoter, and 20 percent of Zuffa’s top-five Fighters first achieved a top five ranking at another MMA promoter.

232. Finally, it bears emphasis that Dr. Topel’s opinion that Zuffa “helped t[urn] the sport of MMA into one of the fastest-growing sports in the world”<sup>744</sup> is irrelevant as a defense to the Challenged Conduct. In order for it to be relevant, Dr. Topel would need to show that absent the Challenged Conduct—for example, absent the restrictions on Fighter mobility in its contracts—Zuffa would not have invested in the development of MMA or in its Fighters. But nowhere does Dr. Topel make this claim, and nowhere does Dr. Topel even attempt to quantify what effect the Challenged Conduct is purported to have on investments Zuffa made in the sport or its fighters. In the but-for world, Zuffa (and other MMA promoters) would face clear incentives to “evangelize” MMA, just as any profit-maximizing firm has incentives to invest in activities that increase the demand for its product. If anything, the incentive to “evangelize” MMA would be

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744. *Id.* ¶57.

greater in a but-for world with more competition, as rival promoters would have a better chance to recoup their investments. The Challenged Conduct is not about Zuffa's investments in MMA generally (or of Fighters specifically). The Challenged Conduct implicates the restraints that Zuffa has put in place to substantially foreclose other MMA promoters, suppress Fighter pay, and harm competition generally. Nowhere does Dr. Topel provide evidence that, absent such competitive restrictions, investments in the sport of MMA or in MMA Fighters would not have occurred.<sup>745</sup>

## **2. Dr. Topel Admits That the Challenged Conduct Is a Barrier to Entry That Permits Zuffa to Exercise Monopsony Power**

233. Consistent with my conclusion that the Challenged Conduct is a barrier to entry and expansion,<sup>746</sup> Dr. Topel opines that "eliminating the challenged contract provisions could promote entry by competing promoters[.]"<sup>747</sup> Dr. Topel opines that "such entry would not be efficient or procompetitive,"<sup>748</sup> claiming that incentives to invest would be dampened.<sup>749</sup> As explained in Part V.C, Dr. Topel provides no evidence that the Challenged Conduct increased investment in Fighters or in MMA.

234. My initial report anticipates Dr. Topel's claims regarding investment, which echo the claims of professional sports leagues in the past, attempting to justify labor market restrictions on Fighter mobility by claiming that they are necessary to incentivize investment for the benefit of the sport. My initial report explains that these claims have been contradicted by both the

745. In an attempt to demonstrate that the UFC has procompetitively increased consumer choice, Dr. Topel simply observes that Zuffa has promoted events in, and Fighters from, a variety of locations both inside and outside the United States. *Id.* ¶60. As before, Dr. Topel provides no evidence that this claimed procompetitive benefit is somehow the result of the Challenged Conduct. In the but-for world, Zuffa (and other MMA promoters) would also have incentives to "increase[] the variety of MMA events and athletes available to U.S. consumers." *Id.* If anything, these incentives would be greater in a but-for world with more competition.

746. Singer Report Part III.A.7.

747. Topel Report ¶68.

748. *Id.*

749. *Id.*

experience of free agency in other professional sports leagues and numerous studies from the sports economics literature.<sup>750</sup> Far from harming the industry, the increased competition that would prevail in a but-for world without the Challenged Conduct would be expected to benefit Fighters, fans, and the industry as a whole.<sup>751</sup> Again, neither Dr. Topel nor any of Zuffa's economists make any attempt to rebut this evidence. Further, Dr. Blair concedes that suppressing athlete compensation below MRP would have a negative impact on a sport.<sup>752</sup>

#### **C. That Other MMA Promoters' Contracts With Fighters Were Sometimes Similar to Zuffa's Does Not Demonstrate that the Challenged Contracts Were Procompetitive**

235. Dr. Topel claims that the Challenged Conduct is procompetitive because some MMA promoters, such as Bellator, have followed Zuffa's lead by including some provisions similar to the Challenged Conduct in their own Fighter contracts.<sup>753</sup> As explained below (and discussed briefly above), Zuffa's adoption of exclusive provisions incentivized non-Zuffa promoters to follow suit by adopting the "industry standard" established by Zuffa.<sup>754</sup> In practice,

750. Singer Report ¶¶286-290.

751. *Id.*

752. Blair Dep. at 148:24-149:5 ("the quality of the play would be lower and that ... in turn, could have an impact on fan demand for watching major league games and ... to that extent, the value of the product that's being offered, that is the competition of the field ... is lower and consumers are worse off as a result").

753. Topel Report ¶¶83-84. Dr. Topel makes similar claims with respect to named plaintiff Brandon Vera's contract with ONE Championship. *Id.* ¶83. However, it is entirely possible that ONE Championship, like Zuffa, has significant market power, in light of evidence that ONE Championship's market share in Asia is on the order of 90 percent, comparable to Zuffa's North American market share. Singer Report ¶¶121-122.

754. See, e.g., A. Douglas Melamed, *Exclusionary Conduct under the Antitrust Laws: Balancing, Sacrifice, and Refusals to Deal*, 20(2) BERKELEY TECH. L. J. 1248-66, 54 (March 2005) ("The likelihood that, and extent to which, exclusionary conduct will weaken or exclude rivals often depends a great deal on how the rival responds to the conduct-on whether he responds creatively, efficiently, and effectively in the marketplace. But if the determination over whether a defendant's conduct is anticompetitive depends in large part on the impact of the conduct on the defendant's rivals and their customers, the incentive of the rivals to respond to suspected exclusionary conduct by aggressive and creative marketplace conduct of their own will be diminished."), available at <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1579&context=btlj>. Dr. Blair testified that firms in the competitive fringe will match the contract terms imposed by a monopsonist, just as they will match the anticompetitive suppressed price paid by the monopsonist. See Blair Dep. at 112:25-115:6 ("Q. Does the same logic of [the umbrella pricing] model apply ... to non-price transactional terms such as who bears the risk of injury, for example? A. ... [W]hen we start to talk about some of these terms ... one would expect ... maybe not initially, but you would expect

other MMA promoters' contracts were less restrictive than Zuffa's, and allowed Fighters to depart when presented with a better offer from Zuffa. Finally, conduct that is anticompetitive when practiced by a dominant firm is not necessarily anticompetitive when practiced by a firm without market power. Antitrust precludes firms with market power from engaging in certain conduct because it is the *interaction* of market power and exclusion that generates anticompetitive effects.

**1. The Challenged Conduct Incentivized Other MMA Promoters to Adopt Fighter Contracts Similar to Zuffa's "Industry Standard," and Rivals' Contracts Were Less Restrictive Than Zuffa's In Practice**

236. Record evidence indicates that promoters such as Bellator included restrictive terms in their contracts because Zuffa did so, and would have removed them had Zuffa had done so. This renders the Bellator contracts a tainted (or at minimum, conservative) benchmark for the purposes of drawing inferences about the competitiveness of such restrictions. Scott Coker of Strikeforce testified that the right-to-match clause was:

something that really came from the UFC, and it was like an industry standard, when I got into the business, right. So they are the first ones to put it in there. And so, for us to be competitive, we had to put it in there as well... And if one company out there that's industry leader is doing it and you're not doing it, then it's not creating a fair playing field.<sup>755</sup>

An e-mail from 2012 indicates that Bellator's CEO Bjorn Rebney would have been willing to eliminate the right-to-match period if Zuffa would do likewise.<sup>756</sup> The Fighter contracts of non-Zuffa promoters were also less restrictive than Zuffa's in practice. My initial report explains that other MMA promoters made exceptions to exclusivity (sometimes referred to as "Zuffa out")

the terms to wind up being roughly the same ... in a market ... just through adjustments over time as you move to an equilibrium.").

755. Coker Dep. at 245:14-246:9.

756. See ZFL-1904802 (e-mail from sportswriter Michel Chiappetta to Anthony Evans, the Director of Media Relations at the UFC) ("I spoke to Bellator's [CEO] Bjorn Rebney today about the matching rights clause for fighters that have been released...Eventually, he said he would be willing to do away with the section that allows them to release a fighter and retain matching rights if Zuffa would also do the same.").

clauses), and by serving as “feeder leagues” to Zuffa.<sup>757</sup> And even when an explicit Zuffa-out clause has been absent, Zuffa has been able to recruit champions or other high-value Fighters from other MMA promotions.<sup>758</sup> Jeffrey Aronson, CEO of Titan, testified that he and Resurrection Fighting Alliance sometimes “borrowed” each other’s Fighters, rather than obligating their respective Fighters to always fight exclusively for their respective promotions.<sup>759</sup> Kurt Otto of IFL testified that he would make exceptions to exclusivity for IFL Fighters to “let that person generate revenue maybe at another fight organization and allow them to fight.”<sup>760</sup> Otto also testified that, unlike the UFC, other MMA promoters would allow IFL to use their content to promote IFL Fighters who had previously fought for the other promoter.<sup>761</sup>

237. Dr. Topel opines that, if the Challenged Conduct were not procompetitive, then MMA promoters such as Bellator “could make a more attractive offer to athletes by offering shorter and less restrictive contracts, and use that as a competitive advantage relative to UFC.”<sup>762</sup>

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757. Singer Report ¶107, ¶¶135-136.

758. *Id.*

759. Aronson Dep. at 60:6-61:9 (“RFA [Resurrection Fighting Alliance] has borrowed fighters from me and I’ve borrowed fighters from them. It’s been a reciprocal, mutually beneficial relationship …Q. Did RFA borrow fighters from Titan? A. Um-hum. Q. And vice versa? A. Yes. Q. What does it mean to borrow a fighter? A. In other words, if RFA needed a fighter for a weight class, and I was in the middle of doing a show and didn’t have a fight for that fighter until the next show, I would allow RFA to use one of my fighters, and if they had the same situation they would allow me to borrow one of their fighters. Q. Would you describe that as a mutually beneficial relationship? A. Sure. And beneficial for the fighter, because it keeps them busy and gets them a paycheck and hopefully gets them another win.”).

760. Deposition of Kurt Otto, February 6, 2017, 328:21-329:12 (“… while they were with the IFL, those athletes could not go and compete for another MMA promotion; is that right? A. Typically not. They’re under contract, but if there was some specific thing -- an example, let’s say that you had a fighter under contract, and the coach preferred putting in -- a better fighter in that person’s spot that once had a starting position, but that person wasn’t starting any longer and he was under contract, we would work with the coach to let that person generate revenue maybe at another fight organization and allow them to fight.”).

761. *Id.* at 128:16-129:4 (“Q. Yes. Did you ever, in promoting IFL fights, use former videos of your fighters of prior fights? A. With the UFC content? Q. First of all, just generally. A. Yes. Other organizations gave us content. Not the UFC, other organizations gave us content to use for our reels. Absolutely. Q. To promote your fights? A. Yes. And, interestingly enough, the UFC has used IFL content to promote their fighters.”).

762. Topel Report ¶114.

This ignores Zuffa's first-mover advantage, which Dr. Topel himself concedes.<sup>763</sup> Given that (due at least in part to the Challenged Conduct) the UFC is the dominant destination for other Fighters, and given that Zuffa's Fighters are bound to Zuffa due to the Challenged Conduct, MMA promoters such as Bellator clearly cannot gain a significant competitive advantage by unilaterally offering shorter and less restrictive contracts. Doing so would simply give Zuffa more and better opportunities to sign away promising Fighters, while simultaneously failing to lure away Fighters bound to Zuffa by the Challenged Conduct. Economists have demonstrated in other contexts that it does not make economic sense for competitors to unilaterally "take the high road."<sup>764</sup>

## **2. Dr. Topel Assumes Incorrectly That Conduct Undertaken by a Non-Dominant Firm Is Necessarily Procompetitive When Practiced By a Dominant Firm**

238. Dr. Topel's defense of the Challenged Conduct assumes (without citation to any authority) that conduct undertaken by a firm without significant market power is necessarily procompetitive when undertaken by a firm with significant market power.<sup>765</sup> This assumption is wrong. Economists and antitrust scholars recognize that conduct is examined through a "special lens" when a firm has significant market power:

Where a defendant maintains substantial market power, his activities are examined through a special lens: Behavior that might otherwise not be of concern to the antitrust law—or that might even be viewed as procompetitive—can take on exclusionary connotations when practiced by a monopolist.<sup>766</sup>

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763. Topel Dep. at 442:10-14; Topel Report ¶96.

764. See, e.g., Xavier Gabaix & David Laibson, *Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets*, 121 Q.J. ECON. 505 (2006) (showing that firms would find it more profitable to pursue a pricing strategy that exploited myopic consumers with higher prices than to attempt to steal customers from one another by slashing prices of ancillary services, even in "highly competitive markets.").

765. Topel Report ¶84 ("The use of such provisions by entities that could not plausibly possess monopsony power...indicates that the provisions in these contracts have a procompetitive purpose."). See also ¶¶80-84, ¶117.

766. *Eastman Kodak Co. v. Image Technical Servs.*, 504 U.S. 451, 483 & n.32 (1992) (citing P. Areeda & D. Turner, *ANTITRUST LAW* ¶ 813, pp. 300-302 (1978)); see also Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L.R. 172 (2003) [hereafter, "Elhauge"].

Accordingly, the “usual caveat”<sup>767</sup> when analyzing exclusionary conduct is to recognize that:

[E]ven where the conduct by a competitive firm is determined to be procompetitive, that showing alone does not imply that the same conduct by a dominant firm would be procompetitive.<sup>768</sup>

Among competitive firms, exclusive contracts may have various procompetitive benefits; they may increase price competition among suppliers, reduce risk by guaranteeing a source of inputs, and provide incentives to provide better products and service.<sup>769</sup> Exclusive dealing is therefore less likely to be anticompetitive whenever there is “competition among a number of relatively equal competitors each with its own exclusives, and no coordination[.]”<sup>770</sup> Therefore, a threshold condition for establishing that the Challenged Conduct is anticompetitive is to prove that Zuffa has significant market power, as explained (and demonstrated) in my initial report.<sup>771</sup>

239. As a consequence, to the extent that other MMA promoters did engage (however unsuccessfully) in contracting practices similar to the challenged contractual provisions, that would provide no economic justification for those provisions. If anything, competitive options for Fighters, and competition generally, would be further harmed when Zuffa’s restrictive contracting practices are mimicked by other MMA promoters.<sup>772</sup>

### **3. Multi-Bout Exclusive Contracts Could Remain in the But-For World, Despite Dr. Topel’s Straw-Man Attacks**

240. My initial report explained that Zuffa has previously put forth a straw-man defense of multi-fight contracts, and that this assumes incorrectly that the only alternative to the

767. Salop (2017) at 374, n. 10 .

768. *Id.*

769. *Id.* at 395-396.

770. *Id.* at 396. The use of exclusive contracts among non-dominant firms can harm competition under certain conditions. For example, “parallel exclusion by multiple firms can lead to anticompetitive coordination.” *Id.* at 374.

771. Singer Report ¶5; *id.* Parts III.A-B.

772. *Id.* ¶263.

Challenged Conduct would be single-bout contracts.<sup>773</sup> But the controversy here is not the existence of multi-fight contracts *per se*, but instead whether the *degree* of the restrictions contained in Zuffa's contracts (given Zuffa's monopsony power), the term of the restrictions, and the practices Zuffa uses to maintain its monopsony power, are sufficiently high so as to generate anticompetitive effects that outweigh any possible procompetitive benefits.<sup>774</sup> My initial report shows that to be the case.<sup>775</sup>

241. Dr. Topel resurrects this straw-man argument, implying incorrectly that eliminating the Challenged Conduct is equivalent to eliminating all multi-bout contracts.<sup>776</sup> Dr. Topel also provides no evidence to support the notion that competition would be harmed if Zuffa Fighters were subject to less restrictive contracts of shorter duration. Dr. Topel states that Zuffa “plan[s] events months in advance,”<sup>777</sup> but does not explain how this would justify the contractual duration of exclusivity encompassed by the Challenged Conduct (which exceeds 30 months even if one ignores contract renewals and extensions). Dr. Topel emphasizes the benefits to Zuffa of longer durations of exclusivity, but fails to balance those supposed benefits to Zuffa against the cost to Fighters, and to competition more generally. In his deposition, Dr. Topel admitted that it would not be procompetitive for Zuffa to lock up Fighters in perpetuity because “Zuffa would capture the entire returns to their human capital investments.”<sup>778</sup> By the same logic, the Challenged Conduct allows Zuffa to capture more of the returns to Fighters’ human capital than in the but-for world.

773. *Id.* ¶264.

774. *Id.*; see also *id.* ¶¶282-283.

775. *Id.* Part III.C.

776. Topel Report ¶¶93-94, ¶113.

777. *Id.* ¶93.

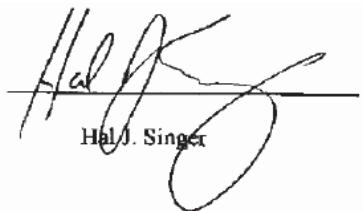
778. Topel Dep at 291:16-25.

This is effectively an admission that at some contract duration, the social costs and costs to Fighters of decreased Fighter mobility exceed the private benefits to Zuffa.

#### CONCLUSION

242. For the foregoing reasons, Zuffa's expert witnesses fail to undermine any of the conclusions of my initial report, and in several instances either concede key underpinnings of my analyses or do not attempt to rebut them at all.

\* \* \*



A handwritten signature in black ink, appearing to read "Hal J. Singer". Below the signature, the name "Hal J. Singer" is printed in a smaller, sans-serif font.

Executed on January 12, 2018.

## APPENDIX: CV

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### Education

Ph.D., The John Hopkins University, 1999; M.A. 1996, Economics

B.S., Tulane University, *magna cum laude*, 1994, Economics. Dean's Honor Scholar (full academic scholarship). Senior Scholar Prize in Economics.

### Current Position

ECONOMISTS INCORPORATED, Washington, D.C.: Principal 2014-present.

GEORGETOWN UNIVERSITY, MCDONOUGH SCHOOL OF BUSINESS, Washington, D.C.: Adjunct Professor 2010, 2014, 2016, 2018.

GEORGE WASHINGTON UNIVERSITY, SCHOOL OF PUBLIC POLICY, GEORGE WASHINGTON INSTITUTE FOR PUBLIC POLICY, Washington, D.C.: Senior Fellow 2016-present.

### Employment History

NAVIGANT ECONOMICS, Washington, D.C.: Managing Director, 2010-2013.

EMPIRIS, L.L.C., Washington, D.C.: Managing Partner and President, 2008-2010.

CRITERION ECONOMICS, L.L.C., Washington, D.C.: President, 2004-2008. Senior Vice President, 1999-2004.

LECG, INC., Washington, D.C.: Senior Economist, 1998-99.

U.S. SECURITIES AND EXCHANGE COMMISSION, OFFICE OF ECONOMIC ANALYSIS, Washington, D.C.: Staff Economist, 1997-98.

THE JOHNS HOPKINS UNIVERSITY, ECONOMICS  
DEPARTMENT, Baltimore: Teaching Assistant, 1996-98.

### **Authored Books and Book Chapters**

*Do Municipal Broadband Networks Stimulate or Crowd Out Private Investment? An Empirical Analysis of Employment Effects*, in THE IMPACT OF THE INTERNET ON JOBS (Lorenzo Pupillo, ed. Palgrave 2017).

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Letter Concerning Spectrum Auction 35 to the Honorable Michael K. Powell, Chairman, Federal Communications Commission, from Peter C. Cramton, Robert W. Crandall, Robert W. Hahn, Robert G. Harris, Jerry A. Hausman, Thomas W. Hazlett, Douglas G. Lichtman, Paul W. MacAvoy, Paul R. Milgrom, Richard Schmalensee, J. Gregory Sidak, Hal J. Singer, Vernon L. Smith, William Taylor, and David J. Teece (Aug. 16, 2002).

## Speaking Engagements

*Antitrust and Telecommunications*, ABA ANTITRUST IN THE AMERICAS, Mexico City, June 1, 2017.

*Fundamentals—Economics*, ABA SECTION OF ANTITRUST LAW SPRING MEETING, Washington D.C., Mar. 29, 2017.

*DOL Rule Analysis and FSR's SIMPLE PTE Explained*, FINANCIAL SERVICES ROUNDTABLE, Washington, D.C., Aug. 6, 2015.

*New Principles for a Progressive Broadband Policy*, PROGRESSIVE POLICY INSTITUTE, Washington, D.C., Mar. 13, 2014.

*The Open Internet: Where Do We Go From Here?* PROGRESSIVE POLICY INSTITUTE, Washington, D.C., Jan. 29, 2014.

*Does Platform Competition Render Common Carriage Irrelevant in an IP world?* PROGRESSIVE POLICY INSTITUTE, Washington, D.C. Nov. 20, 2013.

*The 41st Research Conference on Communication, Information and Internet Policy*, TELECOMMUNICATIONS POLICY RESEARCH CONFERENCE, George Mason University School of Law, Arlington, VA, September 27, 2013.

*The Broadband Technology Explosion: Rethinking Communications Policy for a Mobile Broadband World*, Pepperdine School of Public Policy, Menlo Park, CA. June 20, 2013.

*Net Neutrality: Government Overreach or the Key to Innovation?*, NORTHWESTERN JOURNAL OF TECHNOLOGY AND INTELLECTUAL PROPERTY EIGHTH ANNUAL SYMPOSIUM, Chicago, IL., Mar. 8, 2013.

*Internet Everywhere: Broadband as a Catalyst for the Digital Economy*, The Brookings Institution, Washington, D.C., Nov. 27, 2012.

*Can Broadband Power an Economic Recovery?*, Advanced Communications Law & Policy Institute at New York Law School, Washington, D.C., July 10, 2012.

*Using Regression in Antitrust Cases*, UNIVERSITY OF PENNSYLVANIA LAW SCHOOL, Philadelphia, PA., April 12, 2012.

*Mergers: The Road to Duopoly or Path to Competitive Panacea?* NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS, Los Angeles, CA., July 20, 2011.

*State of the Mobile Net*, CONGRESSIONAL INTERNET CAUCUS, Washington, D.C., May 27, 2011.

*Waves of Innovation: Spectrum Allocation in the Age of the Mobile Internet*, INFORMATION TECHNOLOGY & INNOVATION FOUNDATION, Washington D.C., May 17, 2011.

*With or Without Merit, Class Certification Requires Commonality*, ABA SECTION OF ANTITRUST LAW 59TH ANNUAL SPRING MEETING, Washington, D.C., Mar. 30, 2011.

*4th Annual Future of Private Antitrust Enforcement Conference*, AMERICAN ANTITRUST INSTITUTE, Washington, D.C., Dec. 7, 2010.

*Jobs and Technology*, NEW DEMOCRATIC LEADERSHIP COUNCIL, Washington, D.C., Sept. 22, 2010.

*Regulation and Broadband*, ADVANCED COMMUNICATIONS LAW & POLICY INSTITUTE, NEW YORK LAW SCHOOL, New York, N.Y., July 14, 2010.

*13th Annual Symposium on Antitrust*, GEORGE MASON LAW REVIEW, Washington, D.C., Feb. 4, 2010.

*Broadband Infrastructure and Net Neutrality*, ADVISORY COMMITTEE TO THE CONGRESSIONAL INTERNET CAUCUS' STATE OF THE NET, Washington, D.C., Jan. 22, 2010.

*The Consequences of Net Neutrality Regulations*, AMERICAN CONSUMER INSTITUTE CENTER FOR CITIZEN RESEARCH, Washington, D.C., Nov. 19, 2009.

*Wireless Innovation Luncheon*, MOBILE FUTURE, Washington, D.C., Nov. 3, 2009.

*Second Life Settlements & Longevity Summit*, INSURANCE-LINKED SECURITIES & LIFE SETTLEMENTS, New York, N.Y., Sept. 30, 2009.

*Perspectives on Investment and a National Broadband Plan*, AMERICAN CONSUMER INSTITUTE, Washington, D.C., Sept. 4, 2009.

*Markets and Regulation: How Do We Best Serve Customers?*, Wireless U. Communications Policy Seminar, UNIVERSITY OF FLORIDA PUBLIC UTILITY RESEARCH CENTER, Tampa, FL., Nov. 13, 2008.

*The Price Of Medical Technology: Are We Getting What We Pay For?* HEALTH AFFAIRS BRIEFING, Washington, D.C., Nov. 10, 2008.

*Standard Setting and Patent Pools*, LAW SEMINARS INTERNATIONAL, Arlington, VA., Oct. 3, 2008.

*The Changing Structure of the Telecommunications Industry and the New Role of Regulation*, INTERNATIONAL TELECOMMUNICATIONS SOCIETY BIENNIAL CONFERENCE, Montreal, Canada, June 26, 2008.

*The Debate Over Network Management: An Economic Perspective*, AMERICAN ENTERPRISE INSTITUTE CENTER FOR

REGULATORY AND MARKET STUDIES, Washington, D.C.,  
Apr. 2, 2008.

*Merger Policy in High-Tech Industries*, GEORGE MASON  
UNIVERSITY SCHOOL OF LAW, Washington, D.C., Feb. 1,  
2008.

*Telecommunications Symposium*, U.S. DEPARTMENT OF  
JUSTICE ANTITRUST DIVISION, Washington, D.C., Nov. 29,  
2007.

*Wireless Practice Luncheon*, FEDERAL COMMUNICATIONS  
BAR ASSOCIATION, Washington, D.C., Nov. 29, 2007.

*Association for Computing Machinery's Net Neutrality Symposium*,  
GEORGE WASHINGTON UNIVERSITY, Washington, D.C., Nov.  
12, 2007.

*Regulators' AdvanceComm Summit*, NEW YORK LAW SCHOOL,  
New York, N.Y., Oct. 14, 2007.

*Annual Conference*, CAPACITY USA 2007, New York, N.Y., Jun.  
26, 2007.

*William Pitt Debating Union*, UNIVERSITY OF PITTSBURGH,  
SCHOOL OF ARTS & SCIENCES, Pittsburgh, PA., Feb. 23,  
2007.

*Annual Conference*, WIRELESS COMMUNICATIONS  
ASSOCIATION INTERNATIONAL, Washington, D.C., June 27,  
2006.

*Annual Conference*, MEDICAL DEVICE MANUFACTURERS  
ASSOCIATION, Washington, D.C., June 14, 2006.

*Annual Conference*, ASSOCIATION FOR ADVANCED LIFE  
UNDERWRITING, Washington, D.C., May 1, 2006.

*Entrepreneur Lecture Series*, LAFAYETTE COLLEGE, Easton,  
PA., Nov. 14, 2005.

### **Editorials and Magazine Articles**

*The Future of Net Neutrality: What Will the Court Decide*,  
FOREIGN AFFAIRS, Mar. 16, 2016, co-authored with Robert Litan.

*Obama's Big Ideas for Small Saves: 'Robo' Financial Advice,* WALL STREET JOURNAL, July 21, 2015, co-authored with Robert Litan.

*How the FCC Will Wreck the Internet,* WALL STREET JOURNAL, May 28, 2015

*The FCC's Incentive Auction: Getting Spectrum Right,* PROGRESSIVE POLICY INSTITUTE PAPER, Nov. 2013.

*Clash of the Titans: How the Largest Commercial Websites Got That Way,* MILKEN INSTITUTE REVIEW, Second Quarter 2013, co-authored with Robert Hahn.

*Wireless Competition: An Update,* GEORGETOWN CENTER FOR BUSINESS AND PUBLIC POLICY ECONOMIC POLICY VIGNETTES, May 3, 2012, co-authored with Robert Hahn.

*Book Review of Tim Wu's The Master Switch,* MILKEN INSTITUTE REVIEW, January 2012.

*The AT&T/T-Mobile Deal: Should We Fear Wireless Consolidation?* FORBES, June 3, 2011.

*In FCC's Report on Wireless Competition, an Agenda?,* HARVARD BUSINESS REVIEW, Apr. 15, 2011, co-authored with Gerald Faulhaber.

*Will the Proposed Banking Settlement Have Unintended Consequences?* HARVARD BUSINESS REVIEW, Mar. 29, 2010, co-authored with Joseph R. Mason.

*Should Regulators Block AT&T's Acquisition of T-Mobile?,* HARVARD BUSINESS REVIEW, Mar. 22, 2010.

*The Black Hole in America's Retirement Savings,* FORBES, Dec. 21, 2010, co-authored with Robert Litan.

*Broken Compensation Structures and Health Care Costs,* HARVARD BUSINESS REVIEW, Oct. 6, 2010, co-authored with Robert Litan.

*Why Net Neutrality Is Bad for Business,* HARVARD BUSINESS REVIEW, Aug. 13, 2010, co-authored with Robert Litan.

*Why the iPhone Won't Last Forever and What the Government Should (or Shouldn't) Do to Promote Its Successor*, MILKEN INSTITUTE REVIEW (First Quarter 2010), co-authored with Robert W. Hahn.

*Streamlining Consumer Financial Protection*, THE HILL, Oct. 13, 2009, co-authored with Joseph R. Mason.

*Foxes in the Henhouse: FCC Regulation through Merger Review*, MILKEN INSTITUTE REVIEW (First Quarter 2008), co- authored with J. Gregory Sidak.

*Don't Drink the CAFE Kool-Aid*, WALL STREET JOURNAL, Sept. 6, 2007, at A17, co-authored with Robert W. Crandall.

*The Knee-Jerk Reaction: Misunderstanding the XM/Sirius Merger*, WASHINGTON TIMES, Aug. 24, 2007, at A19, co- authored with J. Gregory Sidak.

*Net Neutrality: A Radical Form of Non-Discrimination*, REGULATION, Summer 2007.

*Telecom Time Warp*, WALL STREET JOURNAL, July 11, 2007, at A15, co-authored with Robert W. Crandall.

*Earmarked Airwaves*, WASHINGTON POST, June 27, 2007, at A19, co-authored with Robert W. Hahn.

*Not Neutrality*, NATIONAL POST, Mar. 29, 2007, at FP19.

*Should ATM Fees Be Regulated?*, NATIONAL POST, Mar. 8, 2007, at FP17, co-authored with Robert W. Crandall.

*Life Support for ISPs*, REGULATION, Fall 2005, co-authored with Robert W. Crandall.

*No Two-Tier Telecommunications*, NATIONAL POST, Mar. 7, 2003, at FP15, co-authored with Robert W. Crandall.

## Memberships

American Economics Association

American Bar Association Section of Antitrust Law

## Reviewer

Journal of Risk and Insurance

Journal of Competition Law and Economics

Journal of Risk Management and Insurance Review

Journal of Regulatory Economics

Managerial and Decision Economics

Telecommunications Policy

**APPENDIX: TABLES**

TABLE A1: IMPACT REGRESSION ALLOWING COEFFICIENTS TO VARY BETWEEN ZUFFA BOUTS AND STRIKEFORCE PRE-ACQUISITION BOUTS

<b>Explanatory Variable</b>	<b>Dependent Variable: Fighter Share</b>		
	<b>Tracked Market Def.</b>	<b>Ranked Market Def.</b>	<b>Headliner Market Def.</b>
<b>Foreclosure Share</b>	<b>-0.0348**</b> <b>(0.0362)</b>	<b>-0.0245***</b> <b>(0.00149)</b>	<b>-0.0308*</b> <b>(0.0938)</b>
Fighter Fixed Effects?	Yes	Yes	Yes
Observations	7,154	7,154	7,154
R-Squared	70%	70%	70%

*Notes:* Robust p-values in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 These regressions include the same control variables as the original impact regressions reported in Table 6 of my initial report. In addition, it includes 44 interaction terms between these control variables and an indicator for Strikeforce pre-acquisition bouts. As explained in Part II.B above, of the 63 interaction terms tested by Dr. Topel, 19 were statistically identical for Strikeforce pre-acquisition bouts and Zuffa bouts. Accordingly, I have re-estimated my impact regression model allowing for the remaining 44 coefficients to vary between Zuffa bouts and Strikeforce pre-acquisition bouts.

TABLE A2: IMPACT REGRESSIONS USING DR. TOPEL'S STRATIFIED FORECLOSURE SHARES

<b>Explanatory Variable</b>	<b>Dependent Variable: Fighter Share</b>				
	<b>Rank 1 to 15</b>	<b>Rank 16 to 30</b>	<b>Rank 31 to 50</b>	<b>Rank 51 to 100</b>	<b>Rank 101 +</b>
<b>Tracked Foreclosure Share</b>	-0.0304** (0.0447)	-0.0301** (0.0473)	-0.0294** (0.0498)	-0.0291** (0.0458)	-0.0368** (0.0469)
<b>Ranked Foreclosure Share</b>	-0.0332** (0.0435)	-0.0335* (0.0501)	-0.0361** (0.0454)	-0.0392** (0.0420)	-0.0353** (0.0268)
Fighter Fixed Effects?	Yes	Yes	Yes	Yes	Yes
Observations	7,154	7,154	7,154	7,154	7,154

*Notes:* Robust p-values in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 The output above is from a total of ten separate regressions, and reflect corrections to Exhibit 16 of Dr. Topel's report. The first five regressions correspond to the first column of Topel Exhibit 16 (which uses the Tracked measure); the second five regressions correspond to the second column of Topel Exhibit 16 (which uses the Ranked measure). I corrected Dr. Topel's analysis by (1) running separate regressions for each of Dr. Topel's five "stratified" foreclosure metrics; and (2) including Strikeforce pre-acquisition bouts (which Dr. Topel had no basis for excluding, as explained in Part II.B above). These regressions include the same control variables as the original impact regressions reported in Table 6 of my initial report.

TABLE A3: IMPACT REGRESSIONS USING NATURAL LOG OF FIGHTER SHARE AS THE DEPENDENT VARIABLE

Explanatory Variable	Dependent Variable: <i>ln</i> (Fighter Share)		
	Tracked Market Def.	Ranked Market Def.	Headliner Market Def.
<i>Foreclosure Share</i>	<b>-0.889***</b> (3.73e-09)	<b>-1.588***</b> (0)	<b>-0.849***</b> (1.10e-08)
<i>Win Flag</i>	0.412*** (0.000)	0.412*** (0.000)	0.412*** (0.000)
<i>Rank</i>	-0.000400* (0.0505)	-0.000397* (0.0502)	-0.000397* (0.0528)
<i>PPV</i>	0.499*** (7.22e-06)	0.501*** (6.66e-06)	0.499*** (7.19e-06)
<i>Constant</i>	-9.755*** (1.34e-07)	-12.36*** (2.24e-10)	-9.781*** (1.31e-07)
Fighter Fixed Effects?	Yes	Yes	Yes
Observations	7,154	7,154	7,154
R-Squared	88.0%	88.1%	88.0%

Notes: Robust p-values in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 These regressions include the same control variables as the original impact regressions reported in Table 6 of my initial report. The only difference is that here the dependent variable is measured as the natural log of the Fighter Share, instead of the Fighter Share itself.

TABLE A4: IMPACT REGRESSIONS USING FIXED REVENUE WEIGHTS  
(FORECLOSURE SHARE CALCULATED USING REVENUE WEIGHTS THAT DO NOT VARY OVER TIME)

Explanatory Variable	Dependent Variable: Fighter Share		
	Tracked Market Def.	Ranked Market Def.	Headliner Market Def.
<i>Foreclosure Share</i>	-0.0320* (0.0511)	-0.0564* (0.0510)	-0.0301* (0.0540)
Fighter Fixed Effects?	Yes	Yes	Yes
Observations	7,154	7,154	7,154
R-Squared	65.7%	65.7%	65.7%

Notes: Robust p-values in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All regressions include fixed effects by weight class, card placement, bout number, year, country, and venue. This regression includes the same control variables as the original impact regressions reported in Table 6 of my initial report. The only difference is that here the foreclosure share is calculated using revenue weights that are fixed over time.

TABLE A5: BUT-FOR REVENUE PROJECTIONS (LIVE MMA EVENTS FEATURING HEADLINERS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Year	Event Revenue (ZUF + SF + BEL + WSOF)	Event Count (ZUF + SF + BEL + WSOF)	Average Revenue per Event: (1) / (2)	Actual Industry Headliner Event Count	Estimated Industry Headliner Event Revenue: (3) * (4)	But-For Industry Headliner Event Count (Flat Trend)	But-For Industry Headliner Event Revenue (Flat Trend) (3) * (6)	Increase in Estimated Industry Revenue (Flat Trend) (7) - (5)	But-For Industry Headliner Event Count (Upward Trend)	But-For Industry Headliner Event Revenue (Upward Trend) (3) * (9)	Increase in Estimated Industry Revenue (Upward Trend) (10) - (5)
2010 12/16/10 – 12/31/10	\$423,974,485 \$18,585,183	69	\$6,144,558	114	\$700,479,584 \$30,705,954			\$4,024,091	114		\$6,599,687
2011	\$414,316,681	68	\$6,092,892	91	\$554,453,206	106	\$646,252,784	\$91,799,578	116	\$705,008,576	\$150,555,370
2012	\$410,822,769	62	\$6,626,174	81	\$536,720,069	106	\$704,944,564	\$168,224,495	117	\$778,215,277	\$241,495,207
2013	\$499,792,571	66	\$7,572,615	84	\$636,099,635	107	\$808,066,831	\$171,967,196	119	\$902,711,216	\$266,611,581
2014	\$436,126,364	80	\$5,451,580	79	\$430,674,784	107	\$583,484,211	\$152,809,427	121	\$659,616,292	\$228,941,508
2015	\$506,654,734	67	\$7,562,011	64	\$483,968,701	107	\$811,793,333	\$327,824,632	123	\$928,693,412	\$444,724,711
2016	\$686,106,821	71	\$9,663,476	71	\$686,106,821	108	\$1,040,492,854	\$354,386,033	125	\$1,204,576,797	\$518,469,975
2017	\$686,106,821						\$1,040,492,854	\$354,386,033		\$1,204,576,796	\$518,469,975
1/1/17 – 6/30/17	\$343,053,411						\$520,246,427	\$177,193,016		\$602,288,398	\$259,234,988
Total (Class Period Through 6/30/17)							<b>\$5,115,281,004</b>	<b>\$1,448,228,468</b>		<b>\$5,781,109,967</b>	<b>\$2,116,633,028</b>

Notes: Average revenue per event calculated from Strikeforce, Bellator, WSOF, and Zuffa data. Flat Trend projections based on Singer Report, Table 4C. Upward trend projections assume total supply of events would have increased by just 1.5 percent per year. Sources: Sherdog.com; Singer Table 3 Backup; Singer Table 10 Backup; Singer Figure 4 Backup; WME\_ZUFFA\_00001150.

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**APPENDIX: MATERIALS RELIED UPON**

Deposition of Jeffrey Aronson, April 25, 2017

Deposition of Robert Arum, October 17, 2017

Deposition of Denitza Batchvarova, January 25, 2017

Deposition of Roger Blair, December 8-December 9, 2017

Deposition of Scott Coker, August 3, 2017

Deposition of Louis John DiBella, August 29, 2017

Deposition of Ike Lawrence Epstein, December 2, 2016

Deposition of Lorenzo Fertitta, March 23, 2017

Deposition of Kirk Hendrick, November 29-November 30, 2016

Deposition of Leon Margules, July 11 2017

Deposition of Michael Mersch, July 14, 2017

Deposition of Kurt Otto, February 6, 2017

Deposition of Paul Oyer, November 29, 2017

Deposition of Sean Shelby, April 12, 2017

Deposition of Carlos Silva, April 18, 2017

Deposition of Joseph Silva, June 7, 2017

Deposition of Robert Topel, December 5-December 6, 2017

Deposition of Dana White, August 9-August 10, 2017

Expert Report of Robert H. Topel, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (October 27, 2017)

Expert Report of Paul Oyer, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (October 27, 2017)

Expert Report of Roger D. Blair, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (November 15, 2017)

Expert Report of Elizabeth Kroger Davis, Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (October 27, 2017)

Expert Report of Hal J. Singer, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (August 31, 2017)

#### Literature

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Fredrik Anderson, Simon Burgess, & Julia Lane, *Cities, Matching and the Productivity Gains of Agglomeration*, 61(1) JOURNAL OF URBAN ECONOMICS 112-128 (2007)

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